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FOURTH ISSUE.

THE MANUAL OF

AMERICAN WATER-WORKS,

1897

COMPILED FROM SPECIAL RETURNS.

Containing the History and Descriptions of the Source and Mode of Supply, Pumps, Reservoirs, Stand-Pipes, Distribution Systems, Pressures, Consumption, Revenue and Expenses, Cost, Debt and Sinking Fund, etc., etc., of the Water-Works of the United States and Canada.

WITH SUMMARIES

For Each State and Group of States,

And Water Rates Charged in over 1,250 Cities and Towns.

Edited by

M. N. BAKER, Ph. B.,

Associate Editor of Engineering News.

THE ENGINEERING NEWS PUBLISHING CO.,

St. Paul Building, New York.

1897.

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PREFACE.

This volume contains descriptions of all water-works completed, under construction or projected in the United States and Canada up to the close of 1896, with later information concerning some new works and projects. The aim has been to give a brief but comprehensive description of each plant, including its history, general character, the capacity of the pumps, reservoirs, stand-pipes, or filters; the extent of the distribution system; and the most important figures relating to the finances of each system. Great pains has been taken to collect information, in addition, bearing on questions of the day, both those relating to economics and to water-works practice, such as: The conditions of franchises; legal difficulties between private water-works companies and cities; conditions governing the use of meters; methods employed in raising money to meet the expenses of extensions to distribution systems; who pays, and how much, for tapping mains for service connections and who for the connections themselves; and whether the several towns listed have sewerage systems.

In general, the figures under distribution and financial, in the case of works built prior to 1896, are for the fiscal year 1895, or 1895-6, many years ending well into 1896. The date the last fiscal year closed is always stated, when ascertained, as well as the date of the report made for this volume and the name of the person who made the same.

The large number of works now requiring description renders necessary the greatest brevity consistent with reasonable fulness and perfect clearness, in order to keep the book within reasonable bounds. Notwithstanding the efforts made to compress the information, 611 closely printed pages are required for the body of this volume, besides which the introduction and table of water rates take up some 30 pages more.

For convenience, the projected works are placed in their proper alphabetical order among the descriptions of completed plants, thus making one complete list of towns for each State and rendering it more easy to find the water-works status of any town. The various classes of works are distinguished by a simple system of numbering, explained in detail at the head of each group.

The table of water rates included in the Manual for 1889-90 proved to be of so much interest and value to water-works officials and others that it has again been made a special feature of the Manual, the fixture and meter rates charged in over 1,250 cities and towns having been collected and tabulated for this book.

The abbreviations on the following page are used in this issue of the Manual.

M. N. BAKER, Editor.

St. Paul Building, New York, April, 1897.

ABBREVIATIONS.

Actg. acting.
Ann. Annual.
approx. approximate.
Assn. Association.
Asst. Engr. Assistant Engineer.
Aud. Auditor.
av. average.
Bd. Board.
Boro. Borough.
Cap. Stock. Capital Stock.
cap. capacity.
cem. cement.
Ch. Chief.
Chn. Chairman.
c. i. cast-iron.
Clk. Clerk.
Co. Company.
Co. County.
Com. Committee.
comp. compound.
Comr. Commissioner.
cond. condensing.
Const. Engr. Constructing Engineer.
constn. construction.
Consult. Engr. Consulting Engineer.
Contr. Contractor.
cts. cents.
Cy. City.
Dept. Department.
Des. Engr. Designing Engineer.
diam. diameter.
dir. act. direct-acting.
Dist. District.
div'd. dividend.
dup. duplex.
dy. daily.
elev. elevation.
Eng. News. Engineering News.
Engr. Engineer.
est. estimated.
exp. expansion.
exp. expenses.
ft. feet.
galls. gallons.
galv. i. galvanized-iron.
guar. guaranteed.
hor. horizontal.
HP. horse power.
hyd. hydraulic.
illus. illustrated.
Imp. Imperial.
in. inch.
inclus. inclusive.
incorp. incorporated.
int. interest.
kal. i. kalamein-iron.
lbs. pounds.
max. maximum.
mech. mechanical.
mfg. manufacturing.
Mgr. Manager.
min. minimum.
p. page.
Pref'd. preferred.
Prest. President.
Pub. public.
pump. pumping.
Pump. Engr. Pumping Engineer.
quad. quadruple.
Recr. Recorder.
Regstr. Registrar.
Rept. report.
Secy. Secretary.
sq. ft. square feet.
sq. mi. square mile.
Sub-Contr. Sub-Contractor.
Super. Engr. Supervising Engineer.
Supt. Superintendent.
Treas. Treasurer.
trip. triple.
unk'n. unknown.
vert. vertical.
V.-Prest. Vice-President.
vol. volume.
w. i. wrought-iron.
w.-w. water-works.
yr. year.

THE MANUAL

—OF—

AMERICAN WATER-WORKS,

1897.

INTRODUCTION.

The magnitude of the water-works interests of the United States and Canada is in some degree shown by the fact that so large a volume as the present should be required to describe the water-works plants of cities and towns alone, without taking up the many plants for military posts, public institutions and manufacturing and other private interests.

Some facts regarding the general scope of the present issue of the Manual are given in the preface. The following introductory pages contain summaries of the present number of works, their ownership and the number of towns supplied, together with a general review of present tendencies in water-works practice.

NUMBER OF WORKS AND TOWNS WHICH THEY SUPPLY.

Much has been written of late regarding changes in the standard of living, the growth of urban population and the rapid increase in municipal expenditures. Of the many phases of the subject, one that has had but little consideration from the general student of social problems is the growth of water-works plants in number and efficiency. Considering only the number of works, it may be noted that at the beginning of this century there were practically no water-works in the United States or Canada, whereas there are now nearly 3,350 complete works in the two countries, supplying more than that number of towns, of which about 2,780 have been built so recently as since 1880, and some 1,400 in the past six years.

Think of the effect upon the standard of living caused by the introduction of a public water supply! In place of the labor attendant upon lifting water by the old oaken bucket, the more prosaic hand pump, or of carrying water in pails from some spring or stream, only a turn of the faucet is now necessary in hundreds of communities to secure either hot or cold water on any floor of a dwelling. The labor saving thus secured, together with the increase in convenience, comfort and cleanliness, is too evident to need detailed mention, especially as both the old and the new are within the experience of so many. Neither is it necessary to more than refer to the other benefits of public water supplies, such as fire protection, street sprinkling, water motors for household, business and light manufacturing purposes. Altogether, the ideas which these few words will suggest, coupled with the large number of villages, towns and cities provided with water-works in recent years, are sufficient to impress one with the immense change in the standard of living and the customs and habits of a vast portion of our population wrought by this one improvement.

Perhaps a word should be said regarding the effect of so many public water supplies upon the health of the countries in question. In most cases, the introduction of running water by the municipality or some private company means the abandonment of badly polluted surface wells, previously the only available source of supply. Exhaustive studies in Massachusetts and elsewhere have shown conclusively that with the abandonment of surface wells for pure public water supplies typhoid fever has decreased to a most marked and gratifying degree. If the general health of a community could be as easily recorded as the typhoid death rate, doubtless it, too, would show notable improvements with every advent of pure to replace impure water.

The second point in the opening sentence, the relation between the increase in urban population and public water supplies, needs only the passing word that the two act and react on each other.

TABLE I.—NUMBER AND OWNERSHIP OF WATER-WORKS IN THE UNITED STATES AND CANADA, AND NUMBER OF TOWNS SUPPLIED.

States and Groups.	Complete works in 1890-1 Manual.	Present Number and Ownership of Works affording both Domestic Supply and Fire Protection.							Works affording partial supply or unclassified.				
			Ownership										
		No. of works.	Public.	Private.	Joint or unknown.*	Outside towns supplied.†	Duplicate works.†	Total number towns with full supply.	Domestic.	Fire protection.	Unclassified.	Approximate number of towns with full or partial supplies.	Projected works.
Maine	37	57	7	50	0	20	1	76	10	5	0	91	4
New Hampshire	36	53	24	27	2	9	0	62	7	2	0	71	2
Vermont	27	46	29	17	0	3	1	48	15	2	0	65	1
Massachusetts	128	151	113	38	0	21	2	170	21	3	0	194	13
Rhode Island	14	15	6	9	0	26	1	40	2	0	0	42	2
Connecticut	48	59	15	44	0	9	1	67	6	0	0	73	6
New England	290	381	194	185	2	88	6	463	61	12	0	536	28
New York	199	342	172	170	0	43	16	369	25	3	5	402	14
New Jersey	58	93	35	58	0	45	2	136	4	0	3	143	4
Pennsylvania	216	342	82	259	1	122	19	445	38	2	9	494	32
Delaware	6	7	6	1	0	0	0	7	0	0	0	7	2
Maryland	18	29	9	20	0	1	1	29	2	0	0	31	6
District of Columbia	1	1	1	0	0	0	0	1	0	0	0	1	1
Middle	498	814	305	508	1	211	38	987	69	5	17	1,078	59
Virginia	41	48	24	24	0	2	0	50	3	0	4	57	3
West Virginia	10	28	12	10	1	3	0	26	2	0	0	28	2
North Carolina	15	18	5	13	0	0	1	17	1	1	0	19	6
South Carolina	7	12	4	8	0	0	0	12	0	1	0	13	6
Georgia	21	36	26	10	0	0	0	36	3	1	1	41	8
Florida	12	19	6	13	0	0	0	19	3	2	0	24	2
South Atlantic	106	156	77	78	1	5	1	160	12	5	5	182	27
Alabama	20	29	9	20	0	1	2	28	1	1	3	33	4
Mississippi	7	9	3	6	0	0	0	9	3	0	2	14	8
Louisiana	4	10	3	7	0	1	1	10	0	0	1	11	6
Tennessee	16	28	10	18	0	3	1	30	2	0	4	36	1
Kentucky	23	44	15	29	0	3	0	47	1	0	0	48	6
South Central	70	120	40	80	0	8	4	124	7	1	10	142	25
Ohio	86	149	114	35	0	6	1	154	1	3	0	158	10
Indiana	50	111	71	39	1	0	0	111	1	1	3	116	6
Michigan	118	156	126	30	0	2	5	153	1	14	3	171	5
Illinois	102	201	158	43	0	4	1	204	3	12	26	245	23
Wisconsin	50	92	56	35	1	5	0	97	0	5	9	111	6
North Central	401	709	525	182	2	17	7	719	6	35	41	801	50
Iowa	77	170	140	28	2	2	0	172	0	19	21	212	13
Minnesota	34	93	81	12	0	0	1	92	1	14	10	117	11
Kansas	79	91	45	45	1	0	1	90	0	0	2	92	0
Nebraska	62	91	80	11	0	1	0	92	1	5	2	100	1
South Dakota	22	31	23	8	0	0	0	31	0	3	4	38	0
North Dakota	7	10	8	2	0	0	0	10	0	1	0	11	0
Wyoming	9	13	8	5	0	2	0	15	0	0	0	15	0
Montana	11	16	2	14	0	0	0	16	1	0	1	18	2
Northwestern	301	515	387	125	3	5	2	518	3	42	40	603	27

* Of the 18 works in this column, 12 are plants owned jointly by a company and municipality, there being one such in N. H., Penn., W. Va., Wis., Kan., Ore., Cal. and Utah; and two each in Iowa and Texas. The ownership of the remaining six plants is unknown.

† Outside towns supplied have to be added to the total number of works; duplicate works have to be deducted from this total to determine the number of towns having public supplies. In the former column are included all towns above one supplied by any single water-works plant; in the latter column are included all works in excess of one in any single municipality.

TABLE I.—Continued.

States and Groups.	Complete works in 1890-1 Manual.	Present Number and Ownership of Works affording both Domestic Supply and Fire Protection. No. of works.	Ownership: Public.	Private.	Joint or unknown.*	Outside towns supplied.†	Duplicate works.†	Total number towns with full supply.	Works affording partial supply or unclassified. Domestic.	Fire protection.	Unclassified.	Approximate number of towns with full or partial supplies.	Projected works.
Missouri	36	62	21	41	0	1	0	63	1	0	1	65	10
Arkansas	12	20	4	15	1	0	0	20	1	0	0	21	3
Texas	60	86	23	60	3	0	1	85	19	6	7	117	19
Oklahoma	0	6	3	3	0	0	0	6	0	0	1	7	1
Colorado	57	68	43	25	0	9	1	76	0	0	6	82	5
New Mexico	9	10	1	9	0	1	0	11	0	0	1	12	1
Southwestern	174	252	95	153	4	11	2	261	21	6	16	304	39
Washington	38	51	25	26	0	1	1	51	4	0	4	59	3
Oregon	26	37	15	21	1	1	3	35	3	0	3	41	2
California	103	121	19	101	1	9	9	121	17	1	9	148	19
Arizona	4	5	1	4	0	0	0	5	0	0	1	6	2
Nevada	9	9	0	9	0	1	0	10	1	0	1	12	1
Utah	7	11	6	4	1	0	0	11	2	0	0	13	0
Idaho	10	14	1	13	0	0	0	14	1	1	0	16	4
Alaska	0	1	0	0	1	0	0	1	0	0	0	1	1
Pacific	197	249	67	178	4	12	13	248	28	2	18	296	32
New Brunswick	5	6	5	1	0	2	0	8	0	0	0	8	1
Nova Scotia	9	20	18	2	0	0	0	20	1	0	0	21	2
Prince Edw. Island.	1	1	1	0	0	0	0	1	0	0	0	1	1
Eastern Provinces.	15	27	24	3	0	2	0	29	1	0	0	30	5
Quebec	24	31	20	11	0	14	1	44	2	0	5	51	2
Ontario	48	75	58	16	1	1	0	76	0	12	0	88	8
Manitoba	1	2	1	1	0	0	0	2	0	0	1	3	1
Northwest Territory	1	1	1	0	0	0	0	1	0	0	0	1	0
British Columbia	6	9	5	4	0	0	0	9	0	0	1	10	4
Int. & Westn Prov	80	118	85	32	1	15	1	132	2	12	7	153	15

TOTALS BY GROUPS.

New England	290	381	194	185	2	88	6	463	61	12	0	536	28
Middle	498	814	305	508	1	211	38	987	69	5	17	1,078	59
South Atlantic	106	156	77	78	1	5	1	160	12	5	5	182	27
South Central	70	120	40	80	0	8	4	124	7	1	10	142	25
North Central	401	709	525	182	2	17	7	719	6	35	41	801	50
Northwestern	301	515	387	125	3	5	2	518	3	42	40	603	27
Southwestern	174	252	95	153	4	11	2	261	21	6	16	304	39
Pacific	197	249	67	178	4	12	13	248	28	2	18	296	32
Total, U. S.	2,087	3,196	1,690	1,489	17	357	73	3,480	207	108	147	3,942	287
Eastern Provinces	15	27	24	3	0	2	0	29	1	0	0	30	5
Int. & Westn Prov.	80	118	85	32	1	15	1	132	2	12	7	153	15
Total, Canada	95	145	109	35	1	17	1	161	3	12	7	183	20
Grand total	2,182	3,341	1,799	1,524	18	374	74	3,641	210	120	154	4,125	307

* Of the 18 works in this column, 12 are plants owned jointly by a company and municipality, there being one such in N. H., Penn., W. Va., Wis., Kan., Ore., Cal. and Utah; and two each in Iowa and Texas. The ownership of the remaining six plants is unknown.

† Outside towns supplied have to be added to the total number of works: duplicate works have to be deducted from this total to determine the number of towns having public supplies. In the former column are included all towns above one supplied by any single water-works plant: in the latter column are included all works in excess of one in any single municipality.

As to the increase in municipal expenditures, it is evident that public water supplies not only cost money in themselves, but like other improvements have a train of followers, each making new demands on the purse, such as sewerage systems and street sprinkling.

The detailed figures regarding the number of water-works plants in each of the commonwealths making up the United States and each of the provinces which comprise the Dominion of Canada, are given in Table I. To give an idea of the recent increase in the number of works in the different states, figures from the last Manual are given in the first column of the table. These figures include water-works completed or under construction up to July 1, 1891, while those in the Manual for 1897 come down to the close of 1896. It will be seen that the total number of works in the United States has increased, between the two issues, from 2,037 to 3,196, and in Canada from 95 to 145, the grand totals being 2,132 in the middle of 1891, against 3,341 at the close of 1896. This increase is, of course, made up of works built in small towns, as all the larger places have been supplied for a number of years. In the West many of the works are very small, but those included in the total are complete plants as far as they go.

The figures just given are the total number of works which furnish both domestic supply and fire protection, 484 other partial and unclassified plants also being included in the book, as well as 307 projected plants. Reference to these will be made further on. The 3,341 works must not be confused with the number of towns actually supplied because (1) there are a number of cases where two or more water-works are located in one town; and (2) many works supply two or more distinct municipalities. Thus there are 74 works in towns where other works also exist, and 374 outside towns supplied by the works included, making a net increase of 300 in the towns supplied, or 3,641 towns served by the 3,341 water-works.

These 3,641 towns, so far as known, all enjoy both domestic supply and fire protection. In addition, there are in the United States and Canada 210 plants that furnish only a domestic supply and 120 furnishing only fire protection, while 154 plants could not be classified, although it is possible that most of them give only partial service, probably fire protection. Of one sort or another there are, then, about 3,800 public water supplies described in the Manual, furnishing water in about 4,100 cities and towns. Besides these, all available information of value regarding 307 projected works is included, so that the present status of the water supply of over 4,400 places is given in the Manual for 1897.

OWNERSHIP OF WORKS.

Of no less interest than the number of works and towns which they supply is the ownership of the several plants. Of the 3,196 complete works in the United States, 1,690, or more than half, are owned by the municipalities which they supply and 1,489 by private companies, leaving 17 plants of unknown ownership. In Canada, there are 109 public and 35 private plants, with one of unknown ownership.

In the early days of water-works construction in this country private ownership was the rule. Thus, at the opening of the century there were 17 cities with more or less complete public water supplies, only one of which was owned by a municipality. As more works were built the relative number of public plants gradually increased, reaching 27.8 per cent. in 1835, when there were 15 public and 39 private works. It took twenty years for this small number of works to double, at the end of which time, or in 1855, there were still only 106 water-works in the United States. Of these, 48, or 45.3 per cent., were owned by the public. In the five years which foreshadowed the strife of 1861-5, and in the half decade of the war, public ownership fell to about 42 per cent. The war over, water-works were built more rapidly than ever before, until in 1875 there were 422 plants, and the public ownership had increased to 54 per cent. of the total, which point has not since been quite attained, although almost reached at the present time. After 1875 privately owned works increased so rapidly that the percentage of public owned works decreased, until in 1890 it was only 42.9 per cent. Since then it has increased again to 53.2 per cent., or just below the 53.8 per cent. of 1855. But in 1875 there were only 422 works in the United States, while now there are 3,196.

In Canada the public works are now over 75 per cent. of the total, Canadian cities sharing the marked English preference for municipal control of water-works and similar undertakings.

In the several States there is much diversity in the proportions of public and private ownership, all of which is shown in detail in Table I. Taking the country by groups, New England and the South Atlantic States are very evenly divided as to ownership; the Middle, South Central, Southwestern and Pacific States have private far outnumbering public works, while in the

TABLE II. — CHANGES IN OWNERSHIP OF WATER-WORKS IN THE UNITED STATES AND CANADA.

Changes from Private to Public.

Works at:	Bought or built.	Date of change.	First supplied in:	Population, 1890 census.
MAINE.				
Auburn	Bought.	1893	1869	11,250
NEW HAMPSHIRE.				
Ashland	Both.	1894	1894	1,193
Bartlett	Bought.	1897	1887	1,247
Dover	Both.	1888	1826	12,790
"	Both.	1888	1832	"
"	Both.	1888	....	"
Franklin	Both.	1891	....	4,085
Hillsboro' B'ge.	Bought.	1897	1887	2,120
Lancaster	Bought.	1894	....	3,373
Milford	Bought.	1891	1889	3,014
Portsmouth	Bought.	1891	1798	9,827
Rochester	Bought.	1891	1885	7,396
Somersworth	Bought.	1896	1864	6,207
VERMONT.				
Barton Land'g.	Bought.	1893	1884	482
Bellows Falls.	Bought.	1873	1848	3,092
Hardwick	Bought.	1891	....	1,547
Morrisville	Bought.	1895	1885	1,500
Swanton	Bought.	1887	1887	3,231
Windsor	Built.	1888	1850	1,884
MASSACHUSETTS.				
Boston	Built.	1848[1]	1652[2]	448,497
Bradford	Bought.	1895	1890	3,720
Braintree	Bought.	1891	1887	4,848
Cambridge	Bought.	1865	1837	70,028
Chicopee	Bought.	1893	1844[3]	14,050
"	Bought.	1893	1881	"
"	Bought.	1892	1892	"
Danvers	Built.	1876	1799	7,454
Gloucester	Bought.	1895	1885	24,651
Gt. Barrington.	Bought.	1890	1867	4,612
" "	Bought.	1890	1889	"
Haverhill	Bought.	1891	1803	27,412
Kingston	Both.[3]	1886[3]	1804	1,659
Lancaster	Bought.	1893	1885	2,201
Lexington	Bought.	1895	1884	3,197
Marblehead	Built.[4]	1889	1887	8,202
Millis	Bought.	1895	1891	786
Newburyport	Bought.	1895	1881	13,947
Orange	Built.	1893	1875	4,568
Peabody	Bought.	1873	1709	10,158
Plymouth	Built.	1855	1796	7,314
Quincy	Bought.	1892	1884	16,723
Salem	Built.	1869	1796	30,801
Sharon	Bought.	1895	1885	1,643
Spencer	Bought.	1884	1883	8,747
Springfield	Bought.	1872	1843	44,179
Stoughton	Bought.	1892	1886	4,852
Uxbridge	Bought.	1890	1880	3,408
Webster	Bought.	1893	1882	7,031
W. Springfield.	Bought.	1892	1875	5,077
Worcester	Bought.	1852	1798	84,655
RHODE ISLAND.				
Providence	Built.	1876	1772	132,146
Woonsocket	Bought.	1885	1884	20,830
CONNECTICUT.				
Danbury	Built.	1861	1833	16,552
Hartford	Built.	1854	1797	53,230
New London	Built.	1872	1802	13,757
NEW YORK.				
Albany	Bought.	1851	1798	94,923
Auburn	Bought.	1894	1855	25,858
Brooklyn[5]	Built.	1889	1880	838,547
" [5]	Bought.	1896	1880	"
Buffalo	Bought.	1868	1852	255,664
Cattaraugus	Built.	'94-6	1890	878
Cohoes	Bought.	1857	1848	22,509
Fort Edward	Built.	1894	1855	4,424
Geneva	Bought.	1896	1787	7,557
Gouverneur	Both.	1890	1867	3,458
Granville	Bought.	1895	1884	1,700
Lestershire	Bought.	1890	1891	....
New York	Built.	1842	1776	1,515,301
N. Tonawanda.	Bought.	1894	1885	4,793
Oneida	Bought.	1895	1883	6,083
Phelps	Bought.	1896	1889	1,336
Richfield Spgs.	....	....	1879	1,623
Saugerties	Bought.	1896	1887	4,237
Schenectady	Bought.	1885	1871	19,902
Syracuse	Bought.	1892	1829	88,143
Ticonderoga	Bought.	1890	1875	2,267
Tonawanda	Bought.	1893	1887	7,145
Washingtonv'l	Bought.	1896	1894	691
NEW JERSEY.				
Atlantic City	Bought.	1895	1883	13,055
" "	Bought.	1895	1889	"
Burlington	Bought.	1877	1804	7,264
Camden	Bought.	1870	1853	38,313
Newark	Bought.	1860	1800	181,830
New Brunswick	....	1873	1868	18,603
Perth Amboy	Both.	'93-4	1882	9,512
Trenton	Bought.	1855	1803	57,458
PENNSYLVANIA.				
Allentown	Bought.	1865	1827	25,228
Bethlehem	Bought.	1871	1761	6,762
Bradford	Bought.	1881	1877	10,514
Edenburg	Bought.	1882	1880	751
Etna	Bought.	1893	1888	3,767
Kennett Sq.	Bought.	1850	1842	1,226
Oxford	Bought.	1870	1868	1,711
Pen Argyle	Bought.	1894	1889	2,101
Philadelphia[6]	Bought.	1866	1851	1,046,964
" [6]	Bought.	1873	1860	"
Reading	Bought.	1865	1821	58,661
Slatington	Bought.	1883	1861	2,716
Troy	Bought.[7]	1893	1880	1,307
Union City	Bought.	1890	1885	2,261
DELAWARE.				
Wilmington	Bought.	1810	1804	61,431
MARYLAND.				
Baltimore	Bought.	1854	1807	434,439
Frederick	Built.	1844	....	8,193
VIRGINIA.				
Danville	Bought.	1876	1875	10,305
Lynchburg	Built.	1828	1799	19,709
Manchester	Bought.	1894	1889[8]	9,246
WEST VIRGINIA.				
Mannington	Bought.	1893	1891	908
NORTH CAROLINA.				
Winston	Bought.	1894	1882	8,018

[1] A second company built works in 1796 and continued in operation on a small scale until 1893, when it was bought out by the city.

[2] Or earlier.

[3] City built works in '86 and bought out Co. in '88.

[4] Supply works, only, city owning distribution from the start.

[5] Two small plants supplying districts lately annexed to city. Also see general note regarding companies bought out before beginning work.

[6] Two small plants supplying territory annexed to city.

[7] There is still a private plant in this place.

[8] First supplied in '40 by works built by city, which were abandoned after completion of company works in 1889.

TABLE II.—Continued.

Works at:	Bought or built.	Date of change.	First supplied in:	Population, 1890 census.
GEORGIA.				
Athens	Built.	1893	1883	8,629
Augusta	Built.	1861	1828	33,300
Griffin	....	1894	1891	4,508
ALABAMA.				
Florence	Bought.	1896	1887	6,012
Huntsville	Bought.	1858	....	7,995
TENNESSEE.				
Clarksville	Bought.	1893	1879	7,924
OHIO.				
Cincinnati	Bought.	1839	1820	305,891
Kenton	....	....	1882	5,557
Painesville	Bought.	1897	1891	4,755
INDIANA.				
Huntington	Bought.	1891	1891	7,328
Lebanon	Bought.	1894	1894	3,682
Mishawaka	Bought.[9]	1873	1891	3,371
MICHIGAN.				
Benton Harbor	....	....	1891	3,692
Bessemer	....	....	1888	2,506
Detroit	Bought.	1836	1827	205,876
Harbour Spgs.	Bought.	1895	1890	1,052
Jackson	Bought.	1871	1870	20,798
ILLINOIS.				
Carlyle	Bought.	1894	1887	1,784
Chicago	Built.	1854	1840	1,099,850
Galesburg	Both.	1891	1883	15,264
Joliet	Bought.	1888	1881	23,264
Lewiston	Bought.[10]	....	1888	2,166
Moline	Bought.	1886	1883	12,000
Ottawa	Bought.	1896	1895	9,985
Peru	Bought.	1892	1892	5,550
WISCONSIN.				
Bayfield	Bought.	1894	1886	1,373
Hayward	Bought.	....	1888	1,349
Kenosha	Bought.	1895	1879	6,532
Watertown	Bought.	1896	1896	862
IOWA.				
Odeboldt	Bought.	1894	1884	1,122
Sioux City	....	....	1885	37,806
MINNESOTA.				
Duluth	Undr constn	1897	1883	33,115
Faribault	Bought.	1893	1884	6,520
Hibbing	Bought.	1895	1894	1,085
Hutchinson	Built.	1894	1891	1,414
St. Paul	Bought.	1882	1870	133,156
Sandstone	Bought.[11]	1893	1888	517
Sauk Center	Bought.	1888	1884	1,695
KANSAS.				
Bunker Hill	....	....	1876	157
Clay Center	Bought.	1893	1885	2,802
Conway Spgs.	....	....	1888	681
Greensburg	Bought.	1892	1888	515
Newton	Bought.	1895	1884	5,605
Springfield	Bought.	1889	1889	347
NEBRASKA.				
Crete	Bought.	1893	1889	2,310
Holdredge	Bought.	1892	1888	2,601
Norfolk	Bought.	1894	1888	3,038
SOUTH DAKOTA.				
Watertown	Bought.	1896	1888	2,672
NORTH DAKOTA.				
Fargo	Bought.	1890	1889	5,664
WYOMING.				
Rawlins	Built.	1892	1882	2,237
Sundance	Bought.	1896	1888	515
MONTANA.				
Fort Benton	Bought.	1893	1888	624
Miles City	Bought.	1895	1890	956
MISSOURI.				
Kansas City	Bought.	1895	1873	119,668
St. Louis	Bought.[12]	1835	1831	451,770
TEXAS.				
Abilene	Bought.	1889	1886	3,194
Austin	Built.[13]	1896	1875	14,575
Brenham	....	....	1895	5,209
Dallas	Bought.[14]	1890	1886	38,067
Fort Worth	Bought.	1888	1883	23,076
Galveston	Built.	1889	1884	29,084
Paris	Bought.[15]	....	1888	8,254
COLORADO.				
Canyon City	....	....	1880	2,825
Central City	Built.	1889	1873	2,490
Georgetown	Bought.	1891	1874	1,927
La Junta	Bought.	1893	1883	1,439
Lamar	Bought.	1889	1887	566
Silver Cliff	Bought.[16]	1894	1880	546
WASHINGTON.				
Ballard	Bought.	1895	1888	1,173
Elmer	Bought.	1894	1891	345
Kent	Bought.	....	1889	853
New Whatcom	Bought.	1893	1890	2,140
Seattle	Bought.	1889	1884	42,837
"	Bought.	1891	1882	"
Spokane	Bought.[17]	1897	1890	19,922
Tacoma	Bought.	1893	1885	36,006
Waterville	Bought.	1896	1891	298
OREGON.				
Astoria	Bought.	1892	1884	6,184
Portland	Bought.	1887	1853	62,046
"	Bought.	1891	1891	"
"	Bought.	1897	1882	"
Scio	Bought.	1894	....	253
The Dalles	Bought.	1890	1862	3,015
CALIFORNIA.				
Colton	Bought.	1895	....	1,315
Gilroy	Bought.	1887	1872	1,694
Modesto	Bought.	1895	1876	2,402
Oceanside	....	1890	1886	427
Ontario	Bought.	1892	1888	683
San Jacinto	Built.	1896	1891	661
Santa Cruz	Bought.	1891	1876	5,596
Woodland	Bought.	1892	1873	3,069
NEW BRUNSWICK.				
Moncton	Bought.	1895	1878	8,763
St. John	Bought.	1885	1836	39,179
NOVA SCOTIA.				
Canning	Bought.	1894	1893	1,000
Halifax	Bought.	1861	1848	38,556
Middleton	Bought.	1895	1892	500
Yarmouth	Bought.	1893	1881	6,689
QUEBEC.				
Montreal	Bought.	1845	1801	216,650
St. Hyacinthe	Bought.	1894	1875	7,016
Valleyfield	Bought.	1887	1886	5,516
ONTARIO.				
Brantford	Bought.	1888	1870	12,753
Brockville	Bought.	1892	1884	8,793
Chatham	Bought.	1895	1891	9,052
Kincardine	Bought.	1894	1890	2,631
Kingston	Bought.	1887	1850	19,264
Niagara Falls	Bought.	1884	1856	3,349
Owen Sound	Bought.	1890	1880	7,497
Toronto	Both.	1873-8	1841	181,220
BRITISH COLUMBIA.				
Kamloops	Bought.	1895	....	1,517
Vancouver	Bought.	1892	1889	13,685

[9] The plant built in 1873 did not furnish domestic supply and was superseded by complete works in 1891, both under private ownership until the latter was bought by city.

[10] City had partial ownership from start.

[11] A private plant supplies a part of the city.

[12] City was part owner from the start.

[13] A private company is still in existence.

[14] These works supplied E. Dallas, which was annexed to Dallas in 1890.

[15] Joint ownership from the start.

[16] Works were built in '80 by city and transferred to bondholders in '86, who organized Co.

[17] Small plant built to supply suburb.

TABLE II.—Continued.

The charters or rights of companies have been bought by the municipalities, and works built by the latter, in the following places: Yarmouth, Me.; Wolfboro, N. H.; Arlington, Mass.; Rockport, Mass.; Brooklyn, N. Y.; Troy, N. Y., and Louisville, Ky. These purchases were made before the companies in question began construction. In Cleveland a company was incorporated in 1833, but did no work, and the city built a plant in 1856.

The following municipalities, now supplied by private companies, were discussing municipal ownership in the latter part of 1896 or early in 1897: Fort Fairfield, Me.; Madison, Me.; Plymouth, N. H.; Dedham, Mass.; Wakefield and Stoneham, Mass.; Nyack, N. Y.; White Plains, N. Y.; Bangor, Pa.; Du Bois, Pa.; Nazareth, Pa.; St. Augustine, Fla.; Dyersburg, Tenn.; Escanaba, Mich.; Traverse City, Mich.; Washburn, Wis.; Palestine, Tex.; Trinidad, Colo.; San Diego, Cal.; San Luis Obispo, Cal.; Santa Barbara, Cal.; Suisun City, Cal.; Tucson, Ariz.; Reno, Nev.; Cornwall, Ont., and Winnipeg, Man. Brooklyn took steps in '90 to buy the works of the Long Island Water Supply Co., which supply one ward of the city, but legal difficulties have prevented completion of proceedings (see p. 92). About the same appears to be true of Vernon, Tex. (see p. 525.)

Changes from Public to Private.

Works at:	Bought or built.	Date of change.	First supplied in:	Population, 1890 census.
RHODE ISLAND.				
E. Providence	Bought.	1895	1893	8,422
NEW YORK.				
Medina	Built.[20]	1893	1890[20]	4,492
PENNSYLVANIA.				
Chester	Bought.	1886	1867	20,226
ALABAMA.				
Jacksonville	Bought.	1889	1883	1,237
LOUISIANA.				
New Orleans	Bought.[21]	1878	1833[21]	242,039
TENNESSEE.				
Columbia	Bought.	1884	1840	5,370
KENTUCKY.				
Frankfort	Built.	1886	1841	7,892
Lexington	Built.	1881	1832	21,567
MICHIGAN.				
Clare	....	....	1886	1,174
ILLINOIS.				
Peoria	Bought.	1889	1868	41,024
MINNESOTA.				
St. Cloud	Bought.	1887	[illegible]3	7,686
KANSAS.				
Beloit	Bought.	1885	1884	2,455
McPherson	Bought.	....	1883	3,172
MISSOURI.				
Sedalia	Bought.	1887	1871	14,068
TEXAS.				
Georgetown	Bought.	1893	1884	2,447
Lampasas	Bought.	1894	1885	2,408
Tyler	Bought.	1883	1883	6,908
UTAH.				
Ogden	Both.	1890	1882	14,889
QUEBEC.				
Maisonneuve	Bought.	1890	....	1,226
St. Cunegonde[22]	Bought.	1891	1879	9,293
St. Henri de Montreal[22]	Bought.	1891	1880	13,415

[20]Fire protection, only.

[21]The works at New Orleans were built by a company in 1833, bought by the city in 1868, and sold to a company in 1878. The city owns a considerable amount of stock in the company, and is represented on the board of directors.

[22]The works at both St. Cunegonde and St. Henri de Montreal were originally built by companies in 1879 and ——, respectively. Each plant is reported as having been sold to the city in 1891 and immediately sold by the city to another company.

In addition to the plants in the above list of changes from public to private ownership a plant at White Haven, Pa., which furnishes a domestic supply, only, was originally built by the borough and sold to a company in 1865.

North Central and Northwestern States the reverse is true. Many individual States are at direct variance with their group tendency. Maine, with 57 works, having only 7 public plants, while Massachusetts has 113 public to 38 private works. New York and Pennsylvania contain the most of the works in the Middle group, with its preponderance of private ownership, but New York has 172 public to 170 private works, while Pennsylvania has only 82 public to 259 private plants.

One of the most significant things regarding ownership is the strong tendency to public control in the larger cities. Of the 50 largest cities in the United States 19 have changed from private to public ownership, and only 9 are now dependent upon private companies for their supply, as follows: San Francisco, New Orleans, Omaha, Denver, Indianapolis, New Haven, Paterson, Scranton and Memphis.

The New Orleans works were once bought by the city and afterwards sold to a private company. The only cities of size which have built works and afterwards sold them to a company are Peoria, Ill., Lexington, Ky., and Chester, Pa. The first of these had a population of about 40,000, and the other two about 20,000 each, in 1890.

Altogether about 200 cities and villages have changed from private to public ownership, and only one-tenth of the number from public to private. Over half of the changes from private to public ownership have been made since the close of 1890 and about one-third of the reverse changes in the same period. The geographical distribution of the works, the dates of the changes, the dates the works were built and the 1890 populations of the cities in which the works are located are shown in Table II.

The largest cities which have changed from private to public ownership since 1890 are Kansas City and Syracuse. Duluth has municipal works under construction, and has voted several times to buy out the local company, but through legal defects in the elections has been prevented from doing so.

Massachusetts takes the lead of the states in changes from private to public ownership, 30 companies, located in 27 different cities and towns, having given way to public ownership, generally through purchase, the changes being begun with the completion of the Boston works by the city in 1848. There remain in the state 38 private, against 113 public works, nearly half of all the plants originally built by companies having been bought by cities or displaced by city plants, and about 20 per cent. of all the works in the state being included in the change. Not a plant built by a city in this state has been turned over to a company.

PRESENT TENDENCIES IN WATER-WORKS PRACTICE.

Of absolutely new things in water-works practice since the publication of the last "Manual," the air-lift pump stands first. Five years ago, it is probably safe to say, not a water-works superintendent had even heard of the theory of the air-lift pump, while to-day the device is in use in several scores of cities. It has come rapidly into use because of its simplicity as a means of raising water from deep wells, and is popular because it affords so ready a means of increasing the yield of wells that have begun to decrease in capacity.

Next to the air-lift pump as a unique thing in raising water comes the gasoline engine, driving some simple form of pump. This, too, is often used for deep wells, but the feature which has brought it so rapidly into use is its extreme simplicity in operation, requiring, in the case of small plants, no constant attendant. This feature, combined with its low first cost and the ease and economy with which it may be started and stopped, has made water-works a possibility and a fact in a great many small Western towns in the past five years. In the Eastern part of the country it has not been employed so much, because the need of a public water supply is not so imperative in small villages as in places of similar size on the Western plains, and when needed the demand may more often be met by small gravity supplies from hillside springs or mountain streams.

The electric motor as a means of driving pumping machinery has a most promising future. A number of such motors are now furnished with current from electric lighting or power plants. There are many pumping stations located at points quite distant from any railway, involving, where steam is used, long wagon hauls for the coal. Some of these are outside the town and others are high service stations, supplying limited sections of a city. In either case it would often be more advantageous to convey current than coal to the pumps. There seems to be a special field for electric pumps for high service supplies, although gasoline engines might be preferable where the areas of population are limited. In many pumping systems the whole of a hilly town is on one pumping service, necessitating a needlessly high head on the pumps in order to supply the higher levels. Often this might be obviated, or water provided for some section without a supply, by having a high service, but the cost of a separate supply main or pumping station seems prohibitory. Electric or gasoline driven pumps might solve the problem, either saving expense in pumping or making some beautiful but elevated residence section more inviting to home seekers.

Notwithstanding the development of electric and gasoline power for pumping, the time-honored windmill still retains a place in connection with public water supplies. To be sure, it is dependent upon the vagaries of the wind, but where the principal object of the water-works is to keep a small tank filled for fire protection, the windmill does excellent service. The modern windmill is wonderfully cheap in construction, requires very little attention, and when supplemented by some more reliable power for use in calms, the combination will lift water for a small village at a remarkably low cost. A gasoline engine would make a good running mate for a windmill, although in appearance the pair might seem decidedly ill-mated. In several instances noted in the "Manual," economy in construction is effected by placing the windmill on top of the tank to which water is pumped. The trestle supporting the tank might be enclosed to house a supplementary pump, when one is provided.

Passing now from small to large pumping plants, the increasing use of pumps with very high duties may be noted. It is true that a few pumps of comparatively high duty were in operation prior to 1890, notably the Corliss pumping engines at Pawtucket. In the last few years a specification now and then has called for a duty of 140,000,000 ft. lbs., or even higher.

A few years ago it looked as if crude oil might, especially under favorable local conditions, be adopted much more generally than it has been as fuel for

water-works boilers, but there have been few if any notable additions to the list of places using oil. Of large cities, Detroit still uses oil, but no other important city can be recalled where oil is in use, although a number of similar cities still use it.

In the introduction to the "Manual" for 1890-1 some figures were brought together, showing very conclusively that the cities having low water consumption per capita had, quite generally, a large percentage of their taps metered, and also that high consumption commonly prevailed where the contrary was true. Great care has been taken to ascertain for the 1897 "Manual" the general conditions governing the use of meters, as well as the extent of their use. It appears from the reports received that the meter is growing in favor, both with water officials and consumers. Some cities and private companies still restrict the use of meters by requiring large deposits or rentals for their use and high rates for the water consumed, but others go so far contrary as to provide meters without cost to the consumer, at the same time making a low price for the water passing through them. Quite a number of works, including some small ones, have adopted the full meter system of late, and many others are moving as rapidly as possible in that direction. The initial step is generally the metering of a few of the largest consumers, proceeding from this to the general adoption of meters, for all but domestic consumers, and making meters possible, even for these and other small water takers. There seems to be a common agreement among water-works officials that, whoever may own the meter, it is essential that the water department should control it, and also that it is not the liberal use but the absolutely useless waste of water that is being fought, and which meters operate to check.

One of the most revolutionary changes in water-works construction within the past five years has been the use of riveted steel pipe for conduits of large sizes. The pioneer in this line, the Newark supply main, 48 ins. in diameter and 21 miles long, was put in use in 1892. Since then other notable steel conduits have been constructed for the water supplies of Rochester, Allegheny, Cambridge, Portland, Ore., Vancouver, B. C., and a large steel intake has been laid on the bed of Lake Skaneateles in connection with the Syracuse water-works. Improved preservative coatings for steel pipe are aiding greatly in inspiring confidence in its durability.

Wood stave pipe continues in favor in the West, but its use has not extended east of the Mississippi River, at least for conduits of any length. In rough country wood stave conduits surpass steel in ease of transportation as much as it, in turn, surpasses cast iron.

The mention of the Newark pipe line brings to mind the fact that the Venturi meter was first used here in connection with a water-works plant and has since been adopted at a number of other places. This device bids fair to come into general use for measuring large quantities of water, there being no limit to the quantity which one meter can measure. It is especially applicable to gravity supplies and to determining the consumption of water from branch pipe lines, either for the supply of a section of a city or where several municipalities are supplied by one plant. The consumption of water from gravity works is now in most cases an entirely unknown quantity, a condition to be avoided if a water-works is to be operated intelligently.

In the design of elevated tanks, curved bottoms have recently been used in a number of instances, and steel supporting towers or trestles are now commonly employed. The elevated tank is now preferred by many engineers to the stand-pipe, it being recognized that in many instances the effective upper 20 or 30 ft. of water can be supported more cheaply, and perhaps safely, by a trestle than by a body of water enclosed in a cylinder. Where high hills are available for sites, and storage is quite as important as pressure, stand-pipes have advantages of their own. The elevated tank is most used in the West, in connection with small water-works systems, where from 30,000 to 60,000 gallons of water stored at a moderate elevation, a well, a small pumping station, a few thousand feet of mains and a few hydrants constitute the water supply for hundreds of small communities. The cost of such a small water-works system is often as low as $5,000 to $6,000, and the benefits to the health and comfort of the community and its advantage as a protection from fire make it a most potent factor in increasing the comfort and attractiveness of village life.

Five years have seen a wonderful increase in the popular demand for pure water. This has been secured in many instances by providing entirely new and naturally satisfactory sources of supply, and in others by some method of water purification. Mechanical filters were introduced some 12 or 15 years ago, and slow sand filtration has been in use at a few places in this country for many years. But within the past five to seven years each process has been coming rapidly to the front, until in the present "Manual" over 100 mechanical filtration plants are listed, and perhaps 10 or 12 filter-bed systems

operated in accordance with the recent flood of light on the subject. Slow sand filtration has been gradually gaining in favor, as the result of disinterested scientific investigation. Mechanical filters have been adopted at scores of places to remove such manifest impurities as silt, color, vegetable matter, odor and iron, aeration commonly supplementing filtration where odor or iron are to be removed. Such impurities as these appeal so powerfully to the senses that the people rise up in veritable wrath and demand their removal. Equally strong insistence on the removal of unseen, but infinitely more dangerous, organic impurities comes more slowly, but is making itself felt none the less surely in many communities. Chemistry, bacteriology and good common sense are aiding mightily in placing impure water supplies in their true light before the public, and in indicating how their use may be rendered unnecessary.

While much is claimed for the bacterial efficiency of mechanical filters, the fact remains that the claims are not yet so firmly verified by scientific research as are those of slow sand filtration. The elaborate experiments at Providence tend to greatly increase confidence in the bacterial efficiency of the process, and all interested in the subject are eagerly awaiting the results of the yet more exhaustive Louisville experiments, on a water of an altogether different character, carried on with a variety of makes of filters, all sufficiently large to make them, in point of size, comparable with filters in regular use. There is no doubt but what both mechanical and slow sand filtration have a great future in this country, and that with the aid of one or the other, pure water for all is a possibility.

There are indications that sedimentation will come into still more general use for waters carrying silt. Large settling basins have been built within a few years at St. Louis and Omaha, and some have long been in use elsewhere. Filter beds for St. Louis were recommended 30 years ago by the late Jas. Kirkwood, in an elaborate report, which, for a quarter of a century, was about the only available treatise in English on the subject of filtration. Mr. Kirkwood considered settling basins an essential accompaniment of filtration, and they were built, although the filters were not.

Larger settling basins have been constructed since, in connection with the new source of supply, higher up the Mississippi River, and the addition of filters is now under consideration. Besides Providence, Louisville and St. Louis, at each of which places filters will doubtless be installed within a few years, Cincinnati and Minneapolis are practically committed to filtration, and Philadelphia, Pittsburg and Albany may soon follow. Other cities, great and small, are also rapidly coming into line, so that in ten years we may expect to see pure water and low typhoid death rates in many places where the contrary now prevails.

In closing this review of some of the most notable tendencies in water-works practice, a word should be said regarding the beneficial effect upon these undertakings which must result from the recent interest taken in the reform of municipal government. While many a familiar name still on the list of officials attests the fact that in many cities a faithful and efficient water-works superintendent or secretary is appreciated, there are more changes than can be accounted for merely by natural causes, or removals for the good of the service alone. If any public servant becomes valuable with increased years and experience, it is the man responsible for the operation of a water-works plant. It is certainly to be hoped that with better municipal government there may come a change in the policy which is still followed in too many cities of making a change in the water supply department heads with every change in the dominant faction in municipal politics; and that instead we may everywhere see the man who discharges his duties faithfully and well retained in his position year after year, so long as his meritorious service continues.

THE MANUAL
—OF—
AMERICAN WATER-WORKS,
1897.

GROUP I.—NEW ENGLAND STATES.

Water-Works Completed, in Process of Construction or Projected, in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

MAINE.

1. **AUBURN,** Androscoggin Co. (11,250.) Now owned by city. Built in '69 by Auburn Aqueduct Co. Acquired in '98 by city by legal process, for $250,000. SUPPLY.—Lake Auburn, by gravity and pumping, the latter supplying about one-fourth the tapa. Two supply mains, one 12 and one 24-in., each about three miles long. PUMPS.—Cap., 2,000,000 galls. 2 Worthington comp., 1,000,000 each. Hard coal used; av. cost, $5.85 per short ton. TANK.—Cap., 600.000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 26 miles; cost extensions met by earnings. Taps, 1,600; made by city, free, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters: 45; owned and controlled by city; repairs paid by consumer; yearly rental, $2 to $12. Use of meters compulsory for manufactories, stables and laundries; city may compel other consumers to use meters and any consumer may have one by paying $15 minimum annual water rate. Hydrants, public, 95. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE. — Ordinary, 50 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $331,440. Bonded debt, $318,000 at 4%, except $10,000 at 5%, mostly due in 10 to 24 yrs. from '95. Expenses, $18,480: Operating, $5,877; int., $12,603; taxes, included in expenses. Revenue: City, fire protection, $3,800; street sprinkling, $100; watering troughs, $100. Water receipts have paid all expenses, including extensions. MANAGEMENT.—Prest., H. G. Foss; Clk., Jerome B. Hunton; Treas., E. G. Eveleth; Supt., Forrest E. Bisbee; Ch. Pump. Engr., L. L. Rand. Rept. by Water Comrs., Aug. 14. PROJECTED IMPROVEMENTS.—A large stone reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 11, '82.

2. **AUGUSTA,** Kennebec Co. (10,527.) Built in '73 by Co., extended by Augusta Water Co. in '86. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,800 per annum for public service. SUPPLY.—Kennebec River, pumping to reservoir; filtered. PUMPS.—Cap., 5,000,000 galls. Water power; R. D. Wood & Co., 2,000,000, Holly hor., 3,000,000. FILTERS.—Cap., 2,000,000 galls. Warren. RESERVOIR.—Cap., 6,000,000 galls. Distributing; Elevation, 325 ft. DISTRIBUTION.—Mains, 22 miles. Taps, 1,500; made by Co. Services, galv. i.; paid for by consumer. Meters: 12; owned, controlled and repaired by Co. Use of meters optional with consumers, except compulsory for hotels and pulp mill. Hydrants, public, 100; private, 6. CONSUMPTION.—(Galls.) av., 1,600,000; max., 1,800,000; min., 1,500,000. PRESSURE.—Ordinary, 120 lbs.; fire, 135 lbs. MANAGE-

MENT.—Prest., Geo. P. Wescott, Portland; Treas., J. H. Manley; Supt., W. H. Williams; Ch. Pump. Engr., John W. Graffam; Rept. by Prest., Nov. 8. REFERENCES.—Eng. News, Sept. 22, '83; Jan. 4, '94 (filters).

3. **BANGOR,** Penobscot Co. (19,103.) Built in '75-6 by city. SUPPLY.—Penobscot River, direct pumping; Drainage area, 7,200 sq. mi. Timber and stone dam, with overflow of 900 ft., and crest 8 ft. above mean high tide. PUMPS.—Cap., 6,000,000 galls. 2 Holly, 3,000,000 each; hor. engine, quadruplex pump, and water power pump. FILTERS.—Cap., 5,000,000 galls.; Warren gravity, to be put in use early in '97. Filter galleries also in use, originally two, side by side, each 12½ × 153 ft., with 8 ft. of sand and gravel through which water passes downward to brick drain. In '95, these were extended, prior to contracting for Warren filters. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 45 miles; cost extensions met by city. Taps, 3,549; made by city, free. Services, galv. i.; paid for by city. Meters: 20; owned, controlled and repaired by city. Use of meters optional with city; compulsory for power purposes. Hydrants, public, 189; private, 4. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 120 lbs.; fire, 120 lbs. Steam fire engines are used. FINANCIAL.—Bonded Debt, $500,000 at 6%. Expenses: Operating, $16,404; int., $30,000. Revenue: Street sprinkling, $750; sewer flushing, $400; public buildings, $10,942; all purposes, $56,245. MANAGEMENT.—Prest., ex-officio, Flavius O. Beal, Mayor; Clk. Water Bd., Walter I. Brown; Supt., M. A. Sinclair; Cy. Engr., Gilbert S. Vickery; Rept. by Clk., Sept. 30. PROJECTED IMPROVEMENTS.—Head gates, flume, five 60-in. McCormick wheels, wheel house, 5,000,000-gall. pump and pump-house, and 75 × 50-ft. tank. Engr., A. B. Tower, Holyoke. SEWERS.—Has sanitary and storm sewers. NOTE.—For description of early work, see Eng. News, March 10, '77. For illustrated description of dam, especially closing in middle sections, see Eng. News, July 26, '94. REFERENCE.—Eng. News, Oct. 1, '81.

4. **BAR HARBOR,** Hancock Co. (624.) Built in '74 by Bar Harbor Water Co. In town of Eden, which was authorized to subscribe to $2,000 of Co.'s stock. In '93, reported that until within a short time the town received water for municipal purposes free of charge, but now the town pays $100 for each fire hydrant. SUPPLY.—Eagle Lake, by gravity. Lake 2 × ¾ miles, 275 ft. above sea. A 24 and 16-in. supply main reported as laid in '87. DISTRIBUTION.—(In '87.) Mains, 15 miles. Taps, 400. Hydrants, public, 20. FINANCIAL. — (In '87.) Cost, $150,000. Cap. Stock, $50,000. NOTE. — No report from Co. since '91 Manual. From press reports it appears that from about '88 to '93, or longer, there was a conflict between the old Co. and persons interested in the introduction of new works under a charter granted about '88 to the Eden Water Co. The new Co. secured extensions to its charter, the last one ('93) conditioned on commencing "actual business" by July, '96, but to become void if the old Co. made certain improvements in supply and distributing mains by July, '94. In the latter part of '93 it was reported that old Co. sold out to wealthy cottagers (in whose interest new Co. seems to have been) for $175,000, and that contract was let for improvements. Directors of reorganized Co. in '93 were reported as Jno. S. Kenney and others of New York, J. Morrill of Boston, and Fred C. Lyman of Bar Harbor.

5. **BATH,** Sagadahoc Co. (8,723.) Built in '86-7 by National Water-Works Syndicate, Boston, Mass., sold in '91 to Maine Water Co. Brunswick supplied from same pumping plant. FRANCHISE.—30 yrs. from '86; does not provide for purchase of works by city. Rates not subject to regulation by city. Co. is exempt from local taxes. City to pay $40 per hydrant per annum. SUPPLY.—Lake Nequasset, in Woolwich, pumped to stand-pipe. Original supply, Thompson's Brook. PUMPS.—Cap., 6,000,000 galls. Blake, 4,000,000; 2 Worthington, 2,000,000. STAND-PIPE.—Cap., 600,000 galls; iron. DISTRIBUTION.—Mains, 24 miles; cost extensions met by bonds and earnings. Taps, 1,530; made by Co. and charged to consumer. Services, galv. i.; paid for by consumer. Meters: 4; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for manufacturers. Hydrants, public, 134. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,300,000; min., 800,000. PRESSURE.—Ordinary, 100 lbs.; fire, 100 lbs. Steam fire engines are used outside of limits of services. FINANCIAL.—Withheld. MANAGEMENT.—Pres., Arthur Sewall, Bath; Secy., G. A. Farrington, Gardiner; Treas., Josiah S. Maxey, Gardiner; Supt., John F. Nash; Ch. Pump. Engr., D. F. Soule; Rept. by Treas., June 15. SEWERS.—Has partial system of sanitary sewers.

6. **BELFAST,** Waldo Co. (5,294.) Built in '87 by Belfast Water Co., under perpetual franchise (or state charter). SUPPLY.—Little River, pumping to stand-pipe. PUMPS.—Cap., 1,935,000 galls.; 2 Deane duplex; one water power, 1,110,000, and one compound (steam), 825,000. RESERVOIR.—Impounding, formed by dam 2 miles south of city. Area, 30.4 acres. STAND-PIPE.—Iron; Cap., 238,000 galls., 30 × 45 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles. Taps, 518; made by Co., free. Services, galv. i.; paid for by consumer to street line. Meters: 11; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical purposes. Hydrants, public, 61. CONSUMPTION.—(Galls.) av., 178,602; max., 204,800; min., 148,300. PRESSURE.—Ordinary, 60 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $180,925. Cap. Stock, Common, authorized, $80,000; paid-up, $20,000. Bonded debt, $73,000 at 5%. Sinking Fund, invested in bonds of Co. MANAGEMENT.—Prest., Chas. F. Parks, Bradford, N. H.; Secy., Chas. Baker; Treas., Elbert Wheeler, 24 Washington St., Boston, Mas.; Supt., D. N. Bird. Rept. Oct.

5, by William Wheeler, Supervising Engr., 89 State St., Boston Mass. SEWERS.—Has sanitary sewers.

7. **BETHEL,** Oxford Co. (783.) Built in '90 by Bethel Water Co. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 100,000 galls.; impounding. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6½ miles. Taps, not given; made by Co. for $10. Services, galv. i.; paid for by Co. to curb line. Meters, 0. Hydrants, public, 25. PRESSURE.—80 to 115 lbs. FINANCIAL.—Cost ('87), $42,000. Cap. Stock, Common, authorized, $60,000; paid-up, $42,000. Debt all bonded, $35,000, at 5%; due in 20 yrs. Expenses (in '90), $6,640: Operating, $2,679; int., $3,417; taxes, $544. Revenue, $6,886: Consumers, $5,549; City, fire protection $1,800; other purposes, $2,087. MANAGEMENT.—Prest., Enoch Foster; Secy. and Treas., A. E. Herrick; Supt., G. A. Hastings. Rept. not signed; made by Co. (?). SEWERS.—Has storm sewers only.

8. **BIDDEFORD AND SACO,** York Co. (Biddeford, 14,443; Saco, 6,075.) Present works built in '84-85 by Biddeford & Saco Water Co. Prior to building of present plant, water was supplied by Saco Water Power Co., evidently for all purposes. FRANCHISE.—Does not provide for purchase of works or regulation of rates by city. SUPPLY.—Saco River, pumping to reservoir; filtered. PUMPS.—Cap., 7,500,000 galls. Worthington, 4,000,000; Deane, 3,500,000. FILTERS.—Cap., 3,000,000; Warren gravity; no coagulant used. RESERVOIR.—Cap., 10,000,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (in '90), 30.3 miles. Taps (in '90), 1,708. Services, galv. i. Meters: 33; owned, controlled and repaired by Co. Hydrants, public, 128. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 25 lbs.; fire, 85 lbs. Steam fire engines are used. FINANCIAL.—(In '90.) Cost, $596,774. Cap. Stock, authorized, $300,000; all paid-up. Bonded debt, $291,000 at 5%; int., $14,550. Revenue: City, $7,308. MANAGEMENT.—Prest., D. W. Clark; Treas., Geo. P. Wescott, Portland, Me.; Supt., James Burnie.

D 1. **BINGHAM,** Somerset Co. (757.) Domestic supply furnished by three aqueducts.

9. **BOOTH BAY HARBOR,** Lincoln Co. (1,699.) Built in '94 by town. Engr., E. H. Gowing, Boston, Mass. Contrs., Moore & Co. SUPPLY.—Lake, pumping to reservoir and stand-pipe. PUMPS.—Cap., 750,000 galls., Deane. Spring Hill culm used; av. cost, $2.40 per short ton. RESERVOIR.—Cap., 250,000 galls. STAND-PIPE.—Cap., 358,000 galls.; 45 x 30 ft. FISCAL YEAR CLOSED March 3. DISTRIBUTION.—Mains, 5½ miles. Taps, 130; made by town, free. Services, galv. i.; paid for by consumer. Meters: 6; owned by town. Use of meters compulsory for factories, only; town may prohibit use. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $38,000. Debt, $38,900; Floating, $2,500 at 5%, $3,500 at 6%; Bonded, $32,900 at 4%. Expenses, $2,600: Operating, $1,000; int., $1,600. Revenue, $1,950. MANAGEMENT.—Water Comrs. Chn., C. J. Marr; Treas., C. F. Kenniston; Supt., Jno. H. Blair. Rept. by Chn. Comrs. NOTE.—Plant reported in '90-1 Manual as under construction by Booth Bay Water Co., evidently never completed.

10. **BREWER,** Penobscot Co. (4,193.)

PUBLIC WORKS CO.

In '91 Public Works Co. acquired plants of Brewer Water Co. and Penobscot Water and Power Co. Co. also owns electric street railways and electric light and power systems of Bangor and Brewer. Management.—Prest., T. M. Laughton; Sec. and Treas., Jas. H. Cutter, Bangor.

BREWER PLANT.

Built in '83 by Brewer Water Co. Supplies also: Milford, Bradley, Orono, Upper Still Water, Veazie, Oldtown. FRANCHISE.—20 yrs. from '87. Does not provide for purchase of works by city. Rates are fixed in franchise to be same as in Bangor, Me. Co. not exempt from local taxes. City to pay $1,250 annually for public service. SUPPLY.—Penobscot River, pumping direct, from pumping plant located at Veazie. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 16 miles. Taps, 1,000; made by Co. free. Services, lead and galv. i.; paid for by consumer. Meters, 0. Use of meters not optional with Co., optional with consumer. Hydrants, public, 30; private, 20. CONSUMPTION. — (Galls.) av., 800,000; max., 900,000; min., 700,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. FINANCIAL.—Expenses: taxes, $439; Revenue, City, fire protection, $1,250; sewer flushing, free; public buildings, $250. Other financial figures not kept separately. MANAGEMENT.—Prest., J. M. Laughton, Bangor; Secy. and Treas., Jas. H. Cutler, Bangor; Supt., H. F. Sparks; Ch. Pump. Engr., J. G. Kimball, Veazie. Rept. by Prest.

10. **BRADLEY,** Penobscott Co. (823, town.) Supply from Brewer.

11. **BRUNSWICK,** Cumberland Co. (6,012.) Built in '86-'7 by Pejepscot Water Co., sold in '91 to Maine Water Co. FRANCHISE.—20 yrs. from '86; option for purchase of works by city expired in '91 or 92. Rates are not fixed in franchise, nor subject to regulation by city. Co. is exempt from local taxes. SUPPLY.—Bath division of Maine Water Co.; have also auxiliary steam pumping plant. Formerly supplied by pumping from 7,000,000 gall. impounding reservoir on Androscoggin River. PUMPS.—Cap., 1,500,000 galls., Deane. FILTERS.—Cap., 1,000,000 galls.; Warren. RESERVOIR.—Cap., 7,000,000 galls. STAND-PIPE.—Cap., 500,000 galls.; iron; 40 x 70 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 16 miles; cost extensions met by earnings and bonds. Taps,

630; made by Co. Services, galv. i.; paid for by consumer. Use of meters optional with Co., but not with consumer. Hydrants, public, 76. CONSUMPTION.—(Galls.) av., 330,000; max., 395,000; min., 260,000. FINANCIAL. — Withheld. MANAGEMENT. — Prest., Arthur Sewall, Bath; Secy., G. A. Farrington, Gardiner; Treas. Josiah S. Maxcy, Gardiner; Supt. A. S. Hall. Rept. by Treas., June 15, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng News, Jan 4, '94 (mech. filters).

12. **BUCKSPORT,** Hancock Co. (2,921.) Built in '89 by Bucksport Water Co.; put in operation Dec. 1. Engr., Parker Spofford; Contrs., P. Spofford and James Mitchell. FRANCHISE.—Unlimited. Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes, but receives no compensation for public service. SUPPLY.—Great Pond, one mile from village, by gravity. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by Co. from receipts. Taps, 100; made by Co. free. Services, galv. i.; paid for by consumer to street line. Meters, 0. Hydrants, public, 10. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Common, authorized, $40,000; paid-up, $20,000; paid 4% dividend in '95. Floating debt, $1,000 at 5%. Expenses: Operating, $600. MANAGEMENT.—Prest., Parker Spofford; Secy., O. P. Cunningham; Supt., E. L. Beazley. Rept. by Prest., Sept. 30.

13. **CALAIS,** Washington Co., and **SAINT STEPHEN AND MILLTOWN, N. B.** (Calais, 7,290; St. Stephen, 2,680; Milltown, 2,146.) Calais plant built in '86 by Calais Water Co., and St. Stephen and Milltown plant in '86-7 by St. Croix Water Co., taking supply from Calais. In '91 both plants came into control of Maine Water Co.; figures for the three places included below. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. Co. is exempt from local taxes. City pays $50 per hydrant. SUPPLY.—St. Croix River, pumping to reservoir. PUMPS.—(In '89.) Cap., 3,000,000 galls. Blake: 2,000,000 dup. comp. cond., 1,000,000 high pressure. FILTERS.—Cap., 2,000,000 galls. Warren. RESERVOIRS.—(In '89.) Cap., 2,500,000 galls. On Todd's Mt., Milltown, N. B., 1½ miles from pump house, and 125 ft. above high water in river at Calais. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 25 miles; cost extensions met by earnings and bonds. Taps, 1,860; made by Co. Services, galv. i.; paid for by consumer. Use of meters optional with Co. Hydrants, public, 168. CONSUMPTION.—(Galls.) av., 850,000; max., 1,000,000; min., 725,000. Steam fire engines used outside of hydrant service. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Arthur Sewall, Bath; Secy., G. A. Farrington, Bath; Treas., Josiah S. Maxcy, Gardiner; Supt., John L. Ray; Ch. Pump. Engr., C. H. Stubbs. Rept. by Treas., June 15, '96. SEWERS.—Partial sanitary system. REFERENCE.—Eng. News, Jan. 4, '94 (mech. filters).

44. **CAMDEN,** Knox Co. (4,621, town.) Supply from Rockland.

14. **CAPE ELIZABETH,** Cumberland Co. (5,459.) Built in '92 or '93 by private co., probably Standish Water & Construction Co. No written report could be obtained, but press reports indicate that water is bought from the Portland Water Co., and brought through an 8-in. main, with a 600,000-gall. w. i. storage tank; also that there are 10 to 12 miles of 8 and 6-in. and smaller distributing mains; also that works had cost $58,000 in '93.

15. **CARIBOU,** Aroostook Co. (4,087.) Built in '89 by Caribou Water Co. FRANCHISE.—20 yrs. from '89. Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Aroostook River, pumping to tank and direct. Dam across river furnishes power for pumping and other purposes; rollway 446 ft. long, 14 ft. high, available HP., about 1,500. PUMP.—(In '88) Cap., 1,000,000 galls.; Blake dup. water power, driven by 140-HP. wheel. TANK.—Cap., 150,000 galls.; 30 x 29½ ft., 218 ft. above pump. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 7 miles. Taps, 200. Meters, 0. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 200,000. FINANCIAL.—Cost, $100,000. Cap. Stock: Common, authorized, $60,000; all paid-up. Bonded debt, $120,000 at 5%. Revenue: City, $2,000. MANAGEMENT.—Prest., Albe Holmes; Treas., Weston Lewis, Gardiner; Supt., Wm. Casney. Rept. in Sept.

16. **CASTINE,** Hancock Co. (987.) Reported as built in '94 by Co., taking supply from wells, and including reservoir. Aug. 15, '96, C. Fred Jones, Town Clk., wrote that A. M. Deveroux was Treas. and Mgr., of Co. Dec. '96, reported that town had contracted for 20 hydrants.

41. **CUMBERLAND MILLS,** Cumberland Co. (1,487.) Supply from Portland.

17. **DAMARISCOTTA,** Lincoln Co. (1,012.) Under construction in '96 by Twin Village Water Co. Nov. 1 mains being laid in New Castle, but town has not yet contracted for fire protection. Engr., W. H. Hayden, Bath, Me. Contrs., W. H. Hayden & Co. FRANCHISE.—12 yrs. from '96; does not provide for purchase of works by city. Rates not subject to regulation by city. Not over $8 to be charged for first faucet. Co. is exempt from local taxes for 12 yrs. City to pay $1,000 per yr. Negotiating with New Castle for same. SUPPLY.—Reed's pond, pumping to stand-pipe. STAND-PIPE.—Cap., 300,000 galls. Taps, 100; made by Co. free. Hydrants, public, 20. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Common, authorized, $50,000. Rept. by K. M. Dunbar, Secy., June 13. SEWERS.—Partially sewered.

41, F 1. **DEERING,** Cumberland Co. (2,732.) Supply from Portland. Nov. 18, '96, Mayor appointed Com. of 3 aldermen and 5 citizens to consider and report on advisability of applying for legislative authority to introduce a supply from Duck Pond, 6 miles distant. Up to Dec. 18 no definite conclusion had been reached. Repts. by I. W. Barbour, City Engr., Nov. 14 and 16.

F 1, D 2. **DEXTER,** Penobscot Co. (2,732.) Built in '96 by town for fire protection. Short pipe system connected with three pumps in mill. Legislative authority for complete works was secured in '96 and Engr. was consulted, but nothing further had been done to Dec. 18. Press rept. stated that on Feb. 16, '97, there would be a legislative hearing on the application of the Dexter Water Co. for an extension of its charter; from this it would appear that the Co. has projected works for two years.

18. **DIAMOND ISLAND,** (Diamond P. O.), Cumberland Co. (Est., 400.) Built in '87 by Diamond Island Water Co. The island is a small one, in Portland Harbor, on which are summer cottages. FRANCHISE.—Perpetual. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Driven, by windmills. STAND-PIPE,—Cap., 175,000 galls. DISTRIBUTION.—Mains (In '90.) 4 miles. FINANCIAL.—Cost, $10,000. Cap. Stock, $5,000. Bonded debt, $5,000 at 6%. MANAGEMENT.—Prest., F. M. Lawrence; Secy. and Treas., I. L. Larabee, Portland.

19. **DOVER AND FOXCROFT,** Piscataquis Co. (Dover, 1,942; Foxcroft, 1,726.) Built in '87 by Dover and Foxcroft Water Co.; sold in '91 to Maine Water Co. FRANCHISE.—40 yrs. from '86; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City pays $50 per hydrant per yr. SUPPLY.—Piscataquis River, pumping to reservoir. Reported that new crib dam across river was built in '95; 210 ft. long, 14 ft. head water on wheels; Engr., B. D. Whitney, Gardiner. PUMPS.—Cap., 1,250,000 galls.; Deane water power. RESERVOIRS.—Cap., 750,000 galls.; distributing. FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 16 miles; cost extensions met by earnings and bonds. Taps, 360; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 270,000; max., 350,000; min., 200,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Arthur Sewall, Bath; Secy., G. A. Farrington, Gardiner; Treas., Josiah S. Maxcy. Supt., J. P. Crocker. Rept. by Josiah S. Maxcy, Gardiner, June 15, '96. SEWERS.—Partial system for household wastes.

20. **EASTPORT,** Washington Co. (4,908.) Built in '89 by Eastport Water Co. FRANCHISE.—Provides for purchase of works by city at any time within 20 yrs. from date of construction. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Reported in '92 as Bayden's Lake, by pumping. MANAGEMENT.—Prest., S. D. Leavitt. Rept. by Prest. in Sept.

21. **ELLSWORTH,** Hancock Co. (4,804.) Built in '89-90 by Ellsworth Water Co. FRANCHISE.—20 yrs. from '89. City to pay $40 per hydrant per yr. SUPPLY.—Branch Pond stream, pumping to stand-pipe. PUMPS.—Cap., 1,200,000 galls.; Deane water-power. FILTERS.—Cap., 2,000,000 galls.; sand and gravel. STAND-PIPE.—Cap., 300,000 galls.; 25 x 80 ft. FISCAL YEAR CLOSED Dec. 31. Taps, 440. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 54; private, 2. PRESSURE.—115 lbs. FINANCIAL.—Cap. Stock, authorized, $100,000. Bonded debt, $75,000 at 5%. Revenue: City, fire protection, $2,160; other purposes, none. MANAGEMENT.—Prest., Henry B. Cleaves; Treas., Geo. P. Wissott; Rept. by Linwood H. Cushman, Supt., July 17, '96. SEWERS.—None.

53. **FAIRFIELD,** Somerset Co. (3,510.) Supply from Waterville.

22. **FARMINGTON,** Franklin Co. (1,243.) Built in '92 by Farmington Water Co.; put in operation in Nov. Engr., M. M. Tidd, Boston, Mass. FRANCHISE.—Unlimited; provides for purchase of works by city in '97. Rates not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay Co. $1,200 per yr. for public services, until '97. SUPPLY.—Sandy River, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Blake. Cumberland coal used; av. cost, $6 per short ton in shed. TANK.—Cap., 250,000 galls.; iron; 40 x 25 ft. on trestle on Powder House Hill. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 5 miles; cost extensions heretofore met by earnings. Taps, not given; made by Co. for $1.50. Services, iron; paid for by consumer. Meters, 0. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 84; private, 3. CONSUMPTION.—(Galls.) av., 70,000; max., 100,000; min., 40,000. PRESSURE.—79 lbs. Steam fire engines used when necessary; not often. FINANCIAL.—Cost, $32,052. Cap. Stock, Common, authorized and paid-up, $30,000; paid 9% div'd in '93. Expenses, Operating, $1,000; taxes, $292. Revenue: Consumers, $3,151; City, fire protection, $1,200. MANAGEMENT.—Prest., F.H.Russell; Secy. and Treas., C.E.Marr; Supt. and Ch. Pump. Engr., L. G. Brown. Rept. by L. G. Brown, Sept 3. SEWERS.—Has partial system of sanitary and storm sewers.

23. **FORT FAIRFIELD,** Aroostook Co. (3,526, town.) Built in '89 by Frontier Water Co. In May, '96, village meeting recommended that steps be taken to ascertain what could be done towards village buying works. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Springs, by gravity. FISCAL YEAR CLOSED Sept. 10. DISTRIBUTION.—Mains.—(In '90.) 4 miles. Taps,

66. Meters, 2. Hydrants, 17. FINANCIAL.—(In '90.) Cost, $30,000. Cap. Stock, authorized, $30,000. Bonded debt, $30,000 at 5%. Expenses, Operating, nominal; int., $1,500; taxes, none. Revenue, $1,677: Consumers, $827; City, $850.

19. **FOXCROFT,** Piscataquis Co. (1,726.) Supply from Dover.

24. **FREEPORT,** Cumberland Co. (2,482.) Built in '91 by Freeport Water Co. FRANCHISE.—Provides for purchase of works by city every 5 yrs., price to be appraised. SUPPLY.—Frost Gully Brook, filtered through gravel, pumping from reservoir to stand-pipe. STAND-PIPE.—Cap., 430,000 galls.; 35 × 60 ft. DISTRIBUTION.—Mains to stand-pipe. STAND-PIPE.—Cap., 430,000 galls.; 35 × 60 ft. DISTRIBUTION.—(In '91.) Mains. 2.7 miles. Hydrants, 18. FINANCIAL.—(In '91.) Cap. Stock, $50,000. Revenue: City, fire protection, $1,000.

25. **FRYEBURG,** Oxford Co. (495.) Built in '82 by Fryeburg Water Co.; put in operation Nov. 10. Co. not exempt from local taxes. City to pay $100 a yr. for fire protection. SUPPLY.—Mountain streams, by gravity from reservoir. Drainage area, 800 acres. RESERVOIR.—Cap., 50,000 galls.; impounding. Taps, 200; made by Co.; no charge. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 21; private, 3. PRESSURE.—60 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock (in '90), $17,000; all paid-up; paid 10% div'd in '90. Expenses: Operating, $100; taxes, $175. Revenue: City, fire protection, $100. MANAGEMENT.—Prest., Otis Warren; Secy., Treas. and Supt., A. R. Jenness. Rept. by A. R. Jenness, June 8, '96. PROJECTED IMPROVEMENTS.—Expect to double capacity of reservoir. SEWERS.—Some storm sewers. REFERENCE.—Eng. News, June 28, '84.

26. **GARDINER AND RANDOLPH,** Kennebec Co. (Gardiner, 5,491; Randolph, 1,281.) Built in '85 by Gardiner Water Co. and extended to Randolph in '88; sold in '91 to Maine Water Co. Main 1,000 ft. long, extends across river to Randolph. FRANCHISE.—20 yrs. from '85; does not provide for purchase of works nor regulation of rates by city. Co. not exempt from local taxes. City to pay $50 per hydrant per year. SUPPLY.—Cobbossee Contee River, pumping to reservoir. Dam across river 124 ft. above tide. PUMP.—Cap., 1,500,000 galls.; Blake, water power. RESERVOIR.—Cap., 2,000,000 galls.; distributing, 236 ft. above tide water and 212 ft. above lower streets of city. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 18 miles; cost extensions met by earnings and bonds. Taps, 1,100; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 64; private, 10. CONSUMPTION.—(Galls.) av., 425,000; max.; 490,000; min., 385,000. PRESSURE.—100 lbs. Steam fire engines are used outside of hydrant service. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Arthur Sewall, Bath; Secy., G. A. Farrington, Gardiner; Treas., Josiah S. Maxcy; Supt., Gustavus Moore. Rept. by Josiah S. Maxcy, Gardiner, June 15, '96. SEWERS.—Partial sanitary system.

27. **GORHAM,** Cumberland Co. (2,888.) Built in '96 by Gorham Water Co. Put in operation June 15, '96. Engrs., Illsley & Cummings, Portland. Contrs., Jos. Wescott & Son, Portland. FRANCHISE.—Perpetual; purchase of works by village optional after 25 yrs., price to be at cost. Reported that rates are fixed in contract. Co. is exempt from local taxes for 25 yrs. City to pay $1,200 a yr. for 10 yrs.; $1,000 a yr. for 15 yrs. SUPPLY.—Sebago Lake, pumping to stand-pipe. PUMPS.—Cap., 1,460,000 galls. Two Deane 1,225,000 comp. 575,000 dup. STAND PIPE.—Cap., 360,000 galls.; iron, 35 × 50 ft. DISTRIBUTION.—Services, paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 31. FINANCIAL.—Cap. Stock, authorized, $50,000; paid-up, $50,000; bonded, $50,000 at 4½%. MANAGEMENT.—Prest., Fredk. Robie; Secy. and Treas., Isaac W. Dyer. Rept. by Secy. SEWERS.—None.

55. **GOULDSBORO,** Hancock Co. (1,709.) Supply is from Winter Harbor.

55. **GRINDSTONE NECK,** Hancock Co. (Not given.) Supply is from Winter Harbor.

F 2. **GUILFORD,** Piscataquis Co. (1,023.) Built by town for fire protection only.

D 3. **HALLOWELL,** Kennebec Co. (3,181.) Built in '76 by Hallowell Water Co. In '96 appraisers were appointed to fix price at which city may buy works. It is expected that a report will be made early in '97. If Co. refuses to sell at price fixed, then city has authority to build works; but it must either buy, or offer to buy, before it can establish a plant. Supply, springs, collected in reservoirs, thence by gravity to village; filtered. Fiscal year closed July 1. Mains, 6 miles. Taps, 200. Meters, 0. Hydrants, public, 1. Cost, $30,000. Cap. Stock, $4,000. Floating, $3,500 at 6%; Bonded debt, none. Expenses, int., $210; taxes, $85. Revenue, Consumers, $2,200. Prest., Joseph F. Bodwell; Secy. Treas., and Supt., Orlando Currier. Rept. by Supt., Sept. 29. PROJECTED IMPROVEMENTS.—Municipal works. REFERENCE.—Eng. News, Mar. 8, '84.

28. **HOULTON,** Aroostock Co. (4,015.) Built in '85 by Houlton Water Co., under perpetual charter. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Stream, by pumping to stand-pipe; filtered through gravel. PUMPS.—Cap., 1,000,000 galls. 2,500,000 Worthington. STAND-PIPE.—Cap., 113,000 galls.; iron; 20 × 50 ft. FISCAL YEAR CLOSED March 31. DISTRIBUTION.—Cost extensions to mains met by earnings. Taps, 400; made by Co. Services, galv. i.; put in by Co. at 50 cts. per ft. Hydrants, public, 42; private, 2. CONSUMPTION.—(Galls.) av., 125,000. PRESSURE.—Ordinary, 40 lbs. One steam fire engine used. FINANCIAL.—

Cap. Stock, authorized, $50,000; all paid up; Debt, none. MANAGEMENT.—Prest., C. H. Pierce; Secy., Treas. and Supt., Walter Mansur; Ch. Pump. Engr., Geo. Ingraham. Rept. by Supt., July 20, '96. SEWERS.—Has sanitary sewers only.

29. **KENNEBUNK AND KENNEBUNKPORT,** York Co. (3,172.) Built in '95-96 by Mousam Water Co. In '90 town had small plant for fire protection only. Co. has 20-year contract with town of Kennebunk, at expiration of which town may buy plant. Town agreed to pay $1,250 a yr. for public service. Charter also covers West Kennebunk, Kennebunkport and Wells. In June, '96, Kennebunkport voted in favor of extension to supply it, at $1,000 per yr. for public service. Also see Ogunquit. SUPPLY.—Branch Brook, pumping to stand-pipe. STAND-PIPE.—Cap., 550,000 galls; 30 x 105 ft.; plates 1-in. thick at bottom, ¼-in. at top; erected by interior floating stage. Supply main, 12-in. DISTRIBUTION.—Hydrants, 42. MANAGEMENT.—Prest., Henry C. Lord, of Alfred; Treas., Geo. F. West, Portland. NOTE.—No official report could be obtained. Above taken from apparently carefully prepared newspaper description of works, dated Dec. 4, '95. which is substantiated as to ownership and pumping to stand-pipe by unsigned report from Kennebunk, made in Dec., '96.

29. **KENNEBUNKPORT,** York Co. See Kennebunk.

30. **LAMOINE,** Hancock Co. (726.) Built in '95 by Cold Spring Water Co. Put in operation Nov.1,'95. FRANCHISE.—Co. is exempt from local taxes at present. SUPPLY.—Spring, pumped to tank by wind-mill. RESERVOIRS. Cap., 12,000 galls. TANK.—Cap., 14,000 galls. DISTRIBUTION.—Mains, 5,940 ft. 2-in. pipe. Taps., 21; made by Co. Hydrants, public, 7. Dwellings pay $2 per yr. without regard to amount used. Four stand-pipes for fire protection. FINANCIAL.—Cost, $2,000. Cap. Stock, authorized, $2,000; paid up, $2,000; pays 8% div'd for 6 months. Expenses: Operating, $2,000. MANAGEMENT.—Secy., F. L. Hodgkins; Treas., N. B. Coolidge; Supt., J. B. Coolidge; Ch. Pump. Engr., D. D. Hodgkins. Rept. by N. B. Coolidge, June 22, '96.

D 4. **LAMOINE BEACH,** Hancock Co. (Not given.) Built in '86-87 by East Lamoine Water Co. Supply from Blunt's Pond, 164 above tide, by gravity, through 1¼ miles of supply main. About ¾ mile of street mains. Cost, (in '90) $3,000. Cap. Stock, authorized, $10,000; paid up, $1,700. No revenue, water being supplied to stockholders only. Prest., W. S. Hodgkins.

31. **LEWISTON,** Androscoggin Co. (21,701.) Built in '78-9 by city. SUPPLY.—Androscoggin River, pumping to reservoir. Drainage area, 80 sq. miles. Dam across river. PUMPS.—Cap., 9,000,000 galls. Water power; 2 Worthington, 1 Deane, 3,000,000 each. FILTER.—(In '89.) Area, 400 sq. ft.; 32 ins. sand and gravel in arched gallery. RESERVOIRS.—Cap., 15,000,000 galls.; storage and distributing, 2 miles from pumping station. Elev., 220 ft. above general level of city. FISCAL YEAR CLOSED Feb. 29, '96. DISTRIBUTION.—Mains, 31 miles; cost extensions met by annual appropriation by city government. Taps, 2,400; made by city. Services, galv. 1.; paid for by city to street line. Meters: 20; owned and controlled by city. Hydrants, public, 169; private, 220. PRESSURE.—60-110 lbs.; steam fire engines are used. FINANCIAL.—Cost, $600,000. Expenses: Operating, $12,000. Revenue, $46,005.50. MANAGEMENT.—7 comrs., chosen by city council, one retiring each year; comrs. elect a supt. and clerk for 1 yr. Prest., C. J. Callahan; Secy., R. C. Pennell; Supt., C. M. Lunt; Ch. Pump. Engr., W. W. Bush. Rept. by Cyrus M. Lunt, July 15, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 11, '82.

41. **LITTLE FALLS,** Cumberland Co. (Not given.) Supply from Portland.

32. **MACHIAS,** Washington Co. (2,035.) Built in '96 by Machias Water Co.; tested in Nov. Learned & Brown, Waterville, Contrs. SUPPLY.—Stream, pumping to stand-pipe. STAND-PIPE.—Cap., 312,000 galls.; 25 x 85 ft. DISTRIBUTION.—Hydrants, 30. MANAGEMENT.—Prest., Jno. K. Ames; Treas., E. B. Curtis. NOTE.—No official report could be obtained. Above from press reports, Apr. to Nov., '96.

33. **MADISON,** Somerset Co. (1,815.) Built in '91 by Madison Water Co. Press despatch, July 30, '96, stated village had voted to buy works for $50,000. Engr., M. M. Tidd, Boston, Mass. Contr., J. J. Newman, Providence, R. I. FRANCHISE.—50 yrs. SUPPLY.—Kennebec River, pumping to reservoir. Reported that dam is of granite, 540 ft. long. PUMPS.—Cap., 1,000,000 galls.; Blake water power. RESERVOIRS.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 120. Services, galv. 1. Meters, 0. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Weston Lewis; Secy., Geo. A. Farrington, Gardiner; Treas., Josiah S. Maxcy, Gardiner; Supt., Wm. L. Remick. Rept. by Treas., June 17. NOTE.—In Jan. Mr. Maxcy stated that town was waiting for legislative authority before buying works.

34. **MECHANIC FALLS,** Androscoggin, Co. (Est., 1,030.) Built in '95 by Mechanic Falls Water Co.; put in operation Oct. 21, '95. Engrs. and Contrs., Wm. H. Hayden & Co. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city after 5 yrs. Rates are subject to regulation by city, in part. Co. is exempt from local taxes. City to pay Co. $1,600 per annum. SUPPLY.—Wells and brook, pumping to stand-pipe. PUMP.—Cap., 1,250,000 galls.; 1 Deane. Georges Creek, Cumberland coal used; av. cost, $5.50 per short ton. STAND-PIPE.—Cap.,

317,000 galls.; iron, 30 x 60 ft.; base reported to be 165 ft. above post-office square. Supply main, reported 12-in. FISCAL YEAR CLOSED Jan. 13. DISTRIBUTION.—Mains, 6¾ miles; cost extensions met by earnings. Taps, 220; made by Co.; free. Services, galv. i.; paid for by consumer. Meters, 1; owned by R. R. Use of meters will be compulsory for manufacturers and hotels. Co. can compel use of meters and any consumer may own one. Hydrants, public, 37; private, 6. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock, authorized, $50,000; paid up, $50,000. Bonded debt, $50,000, at 5%. Expenses, $4,550: Operating, $2,050; int., $2,500. MANAGEMENT.—Prest., C. H. Mason, Bath; Gen. Mgr., Wm. H. Hayden; Treas., F. R. Mason, Bath; Supt., H. E. Mason. Rept. by Wm. H. Hayden & Co., Bath, June 15.

10. **MILFORD,** Penobscot Co. (835.) Built in '91 by Public Works Co., Bangor Engr., H. F. Sparks Brewer. Rates same as in Bangor. Co. not exempt from local taxes. City to pay $800 per yr. for public service. SUPPLY.—Penobscot River, through Public Works Co.'s pumping station at Oldtown. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 2 miles. Taps, 57; made by Co., free. Services, lead and galv. i.; paid for by Co. to property line. Meters, 0. Use of meters optional with consumer. Hydrants, public, 16; private, 2. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. FINANCIAL.—Cannot be separated from other plants of Public Works Co. City, fire protection, $625. MANAGEMENT.—See Public Works Co., Brewer. Rept. by Prest., in Dec.

D 5. **NEW CASTLE,** Lincoln Co. (1,282.) Nov. 1, '96, mains were being laid by Twin Village Water Co., of Damariscotta. Nov. 3, '96, votes indefinitely postponed action on contracting for fire protection, but reported that private consumers would be supplied.

35. **NEWPORT,** Penobscot Co. (1,188.) Built in '94 by Newport Water Co.; put in operation Dec. 1, '94. Engr., E. T. Gowen. Contrs., Moore & Co., Boston, and L. Bushey, Waterville. Co. is exempt from local taxes. Reported Dec. 27, '96, that town had just voted to rent 15 hydrants for 20 yrs. at $40 per yr., each. SUPPLY.—Lake, by gravity to and from reservoir. A siphon 5,000 ft. long, between lake and reservoir, not discharging sufficient quantity, pipe was lowered by excavating 4,000 ft. rock, 18 ft. max. depth. Engr., I. E. Getchell, Waterville. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 6 miles. Taps, 100. Services, iron; paid for by consumer. Hydrants, public, 16. PRESSURE.—Ordinary, 60 lbs. Bonded debt, $40,000 at 5%; due in 1915. MANAGEMENT.—Prest., Wm. S. Hames, Waterville; Treas., C. H. Morrill; Supt. E. R. Harvey. Rept. by Treas., June 15.

F 3. **NORTH ANSON,** Somerset Co. (1,444, town.) Built in '83 by town and Potter & Watson, jointly, for fire protection. Supply, Kennebec River, by direct pumping. In '89 there was a 500,000-gallon Deane pump in use. Mains, ½ mile. Hydrants, public, 6. Pressure, 75 lbs. Cost, $4,000. Rept. by R. Fairbrother, June 6.

36. **NORTH BERWICK,** York Co. (1,803.) Under construction in '96 by North Berwick Water Co.; reported nearly finished in Nov. Engrs. and Contrs., Wm. H. Hayden & Co., Bath, Me. SUPPLY.—Perkins Brook (pumping to tank?). FILTERS.—Cap., 300,000 galls.; Warren gravity, to be put in operation early in '97. FINANCIAL.—Cost (est.), $35,000. MANAGEMENT.—(Reported June 1, '96.) Prest., Chas. R. Mason, Bath; Treas., Frank R. Mason, Bath.

37. **NORWAY AND SOUTH PARIS,** Oxford Co. (Norway, 928; South Paris, 1,164.) Now owned by Norway Water Co. Built in '86 by National Water-works Syndicate, Boston. SUPPLY.—Lake, pumping to reservoir. PUMPS.—Cap., 1,250,000 galls. Worthington. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 9 miles. Taps, 450. Meters, 2. Hydrants, public, 53. PRESSURE.—Ordinary, 80 to 100 lbs. FINANCIAL.Cost, $62,000. Cap. Stock, authorized, $60,000. Bonded debt, $50,000 at 5%; due in 1906. Expenses: Operating, $1,300; int., $2,500. Revenue, $5,800: Consumers, $3,300; City, fire protection, $2,500. MANAGEMENT.—Prest., W. H. Whitcomb; Secy., H. D. Smith; Treas. and Supt., W. W. Whitmarsh. Rept. by Supt., Sept. 29.

P 2. **OGUNQUIT,** York Co. (not given.) Nov. 20, '96, W. F. Cousens wrote that extension of works of Mousam Water Co., Kennebunk, was projected, but nothing definite seemed to have been done to that date. Reported that extension would be through town of Wells, distance of 7 miles.

38. **OLD ORCHARD,** York Co. (877.) Built in '87 by Old Orchard Water Co., under 20 yrs. franchise. SUPPLY.—Spring, by gravity to and from reservoir, with direct pumping for fire protection. PUMPS.—Cap., 1,000,000 galls. Blake, simple dup. high pressure. RESERVOIRS.—Cap., 390,000 galls.; covered. DISTRIBUTION.—Mains, 7½ miles. Taps, 144. Meters, 1. Hydrants, 25. FINANCIAL.—Cap. Stock, authorized, $75,000; paid-up, $61,000. Bonded debt, $64,000 at 6%. MANAGEMENT.—Prest., W. J. C. Milliken; Supt., J. W. Duff. NOTE.—No report since '90-1 Manual.

10. **OLDTOWN,** Penobscot Co. (5,312.) Owned by Public Works Co., Bangor. Built in '90 by Penobscot Water and Power Co. Engr., H. F. Sparks, Brewer, Me. FRANCHISE.—20 yrs. from '90. Does not provide for purchase of works by city. Rates, same as in Bangor. Co. not exempt from local taxes. City to pay $2,542 per yr. for public service. SUPPLY.—Penobscot River, pumping direct. PUMPS.—Cap., 4,000,000 galls. Worthington power pump, 2,000,000; Deane steam pump, 2,000,000. Cumberland coal

used; av. cost, $3.57 per short ton. FILTERS.—Cap., 4,000,000 galls. Mechanical. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—18 miles. Taps, 1,000; made by Co., free. Services, lead and galv. 1.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 61; private, 3. CONSUMPTION.—(Galls.) av., 800,000; max., 900,000; min., 700,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. FINANCIAL.—Taxes, $1,400. Revenue, City, fire protection, $2,542; street sprinkling, free; sewer flushing, free. Balance of financial information not separately kept. MANAGEMENT.—See Public Works Co., Brewer. Ch. Pump. Engr., F. E. Sparks. Rept. by Prest. in Dec. SEWERS.—Has sanitary sewers.

9. **ORONO,** Penobscot Co. (2,790.) Supplied by Public Works Co., Brewer.

D 6. **PATTEN,** Penobscot Co. (936.) Built in '93 by Patten Water Co. for domestic use; put in operation in June. Supply, springs, 85 ft. above town. Fiscal year closes June 30. Mains, ¾ mile. Services, galv. 1.; paid for by property owner. Cost, $1,000. Cap. Stock, authorized, $4,000; paid-up, $420. Revenue, $180. Prest., J. B. Hersey; Treas., Danl. Scribner; Supt., M. B. Smiley. No sewers.

39. **PHILLIPS,** Franklin Co. (1,394.) Built in '96 by Phillips Water Co. Engr., E. H. Gowing, Boston, Mass. Contrs., Moore & Co., Boston. FRANCHISE.—20 yrs. from '96; city may purchase works at the end of 10 or 20 yrs. Maximum rates fixed in franchise. Co. is exempt from local taxes. City to pay $40 per yr. for 20 hydrants, including other uses for public service. SUPPLY.—Mount Blue Pond, reported as 4 miles distant, by gravity to and from reservoir. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 7½ miles. Services, galv. 1.; paid for by consumer. Meters, 0. Hydrants, public, 20; private, 3. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $47,900. Cap. Stock: Common, authorized, $30,000. Bonded debt, $25,000 at 5%; due 1916. Expenses, $1,550: Operating, $300 (est.); int., $1,250. Revenue, $1,250: Consumers (guaranteed in advance), $450; City, $800. MANAGEMENT.—Prest., F. E. Timberlake; Clerk, Mason Parker; Treas. and Mgr., E. H. Gowing, 95 Milk St., Boston; Supt., J. J. Moore. Rept. by Mgr.

40. **PITTSFIELD,** Somerset Co. (2,503.) Now owned by town, or by town and private individual jointly. Built in '95. Reported that town contracted with Pittsfield Water Co., in '94, for 30 hydrants for 20 yrs., and in June, '94, voted to buy franchise and issue $30,000 bonds for works. In Nov., '95, reported that Chas. Baker had $20,000 interest in plant. Engr. and Contr., Chas. F. Parks, Waltham. SUPPLY.—West branch of Sebasticook River, pumping to stand-pipe from above dam. PUMPS.—Cap., 750,000 galls.; Deane dup. STAND-PIPE.—Cap., 250,000 galls.; iron, 25 × 60 ft., on stone foundation. FISCAL YEAR CLOSED Feb. 20. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by appropriations by town. Taps, 185; made by town, free. Services, galv. 1.; paid for by consumer from house to curb. Meters, 0. Hydrants, public, 63. CONSUMPTION.—(Galls.) av., 125,000. Water is furnished to run motors for manufacturing purposes. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $51,000. Bonded debt, $30,000 at 4%; due 1915. Expenses, $3,200: Operating, $1,000; int., $2,200. Revenue, $2,138. Rent of water power, $500. MANAGEMENT.—Supt., Oramel Murray. Rept. by Supt., June 17. PROJECTED IMPROVEMENTS.—Filter wells were to be driven in Aug.; tests have been made. SEWERS.—Sanitary sewers for half of town; partial system for storm water. NOTE.—Later information shows that works are wholly under control of town, which now owes Mr. Baker $15,000. Purchase price was in excess of debt limit, so arrangement was made to pay for only part of plant at start, balance to be paid at pleasure of town.

41. **PORTLAND,** Cumberland Co. (36,425.) Built in '69 by Portland Water Co. Since '70 has supplied villages of Cumberland Mills, Little Falls, Saccarapa and Westbrook, and since '79, Deering. FRANCHISE.—Provides for purchase of works by city at any time at price mutually agreed upon, or failing to agree, by the Court. Rates are subject to regulation by city for manufacturers and large consumers. No compensation for hydrant service in Portland. SUPPLY.—Lake Sebago, by gravity. RESERVOIRS.—Cap., 30,000,000 galls.; 2 distributing, 10,000,000 and 20,000,000, respectively. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 79 miles. Taps, 6,200; made by Co. Services, galv. 1.; consumer pays 40 cts. per ft. Meters, 673; owned by Co. and consumer; controlled and repaired by Co. Use of meters compulsory for manufactories, stables, hotels and steam laundries, and may be extended to other consumers; any consumer may have a meter. Hydrants, public, 365. PRESSURE.—Ordinary, 20 to 60 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, authorized, $1,000,000; all paid-up; paid 4% div'd. Bonded debt, $200,000 at 6%; due 1899; $1,225,000 at 4%; due 1927; $75,000 at 5%; due 1908. Sinking Fund: $40,000, invested at 4% and 5%. Expenses: Operating, $19,000, "and meters, $4,000"; int., $75,000; sinking fund, $5,000; taxes, $14,976. Revenue: Consumers, $156,000; City, sewer flushing and other purposes, $4,000. MANAGEMENT.—Prest., D. W. Clark; Secy., E. R. Payson; Treas. and Supt., Geo. P. Wescott. Rept. by Secy., Aug. 12. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Oct. 22, '81; Lake Sebago dam, June 21, '90; break in reservoir, Aug. 17, 24, 31, and Oct. 5, '93.

42. **PRESQUE ISLE,** Aroostook Co. (3,046.) Built in '87 by National Water-Works Syndicate; now controlled by other parties. FRANCHISE.—20 yrs. from '87. Co. is exempt from local taxes for 20 yrs. City to pay $60 per hydrant per annum. SUPPLY.—

Kennedy Brook, by gravity, with pumping as auxiliary. PUMPS.—Cap., 1,250,000 galls.; Worthington. RESERVOIR.—Cap., 25,000,000 galls.; impounding. Formed by dam across brook, 1¼ miles from village. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by Co. Taps, 130; made by Co. for $10, including service to street line. Services, ¾-in. galv. i.; paid for by consumer from street line. Meters, 0. Use of meters optional with consumer. Hydrants, public, 13. PRESSURE.—Ordinary, 42 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $45,000. Cap. Stock, $45,000. Floating debt, $35,000 (?). Bonded debt, $30,000 at 5%; due 1907. Expenses, Operating, $500. Revenue: City, fire protection, $780; public buildings, free. MANAGEMENT.—Prest. and Supt., G. H. Freeman; Secy. and Treas., Sidney Graves. Ch. Pump. Engr., C. L. Bullard. Rept. by Supt., June 6. SEWERS.—Has sanitary and storm sewers.

26. **RANDOLPH,** Kennebec Co. (1,281.) See Gardiner and Randolph.

43. **RICHMOND,** Sagadahoc Co. (3,082.) Built in '86 by Richmond Water Co. FRANCHISE.—20 yrs. from '86; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay $50 per hydrant per annum. SUPPLY.—Kennebec River, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Knowles. RESERVOIR.—Cap., 1,000,000 galls.; distributing, 200 ft. above river. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 9 miles. Taps, 300; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 57,000; max., 80,000; min., 45,000. PRESSURE, 80 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Weston Lewis, Gardiner; Secy. and Treas., Josiah S. Maxcy, Gardiner; Supt., J. L. Pushard. Rept. by Secy., June 15.

44. **ROCKLAND, CAMDEN AND THOMASTON,** Knox Co. (Rockland, 8,174; Camden 4,261, town; Thomaston, 3,009, town.) Now owned by Camden & Rockland Water Co. Original works built in '51 by Rockland Water Co. In '85 present Co. built competing works, and in '87 extended them to supply Camden & Thomaston. FRANCHISE.—Does not provide for purchase of works by city. Rates not fixed in franchise nor subject to regulation by city. SUPPLY.—Mirror Lake, 7 miles distant, by gravity. RESERVOIR.—Cap., 3,000,000 galls.; storage. DISTRIBUTION.—(in '90) Mains, 80 miles. Taps, made by Co. free. Services, galv. i.; paid for by consumer to street line. Meters: 50; owned by Co. Use of meters compulsory for livery stables, hotels, railroads, steamboats, steam boilers, etc. Co. cannot compel and may prohibit the use of meters. Hydrants, public, 130: Rockland 62, Rockport 26, Camden 19, Thomaston 23; private, 4 (in the state prison). PRESSURE.—95 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., A. F. Crockett, Rockland; Treas., W. S. White; Supt., J. W. Crocker, Rockland. Rept. by Supt., June 6. SEWERS.—Rockland has sanitary and storm sewers. REFERENCE.—Eng. News, May 6, '82.

P 3. **RUMFORD FALLS,** Oxford Co. (Town of Rumford, 898.) Reported in '93 as built in '92 by Rumford Falls Light & Water Co. SUPPLY.—River, by gravity. DISTRIBUTION.—16 to 6-in. pipe. Hydrants, 12 or more. MANAGEMENT.—(Jan., '95.) Prest., Geo. D. Bisbee; Clerk and Treas., Waldo Pettingill.

41. **SACARAPPA,** Cumberland Co. (Not given.) Supply from Portland.

8. **SACO,** York Co. (6,075.) Supply from Biddeford.

45. **SANFORD,** York Co. (4,201.) Built in '87 by Sandford Light & Water Co. SUPPLY.—Springs, by gravity, and (well?) pumping to tank and direct for fire protection. PUMPS.—Cap., 25,000 galls.; reported as operated by electric motor, but formerly windmill was used. In case of fire connection is made with pumps in mills. TANK.—Cap., 60,000 galls.; 24 × 18 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 300. Meters, 0. Hydrants, 16. FINANCIAL.—Cost, $12,000. Cap. Stock, $10,000. Debt, $3,000 at 6%. Expenses: Operating, $100; int., $180. Revenue: Consumers, $2,400; City, none. NOTE.—No report since '90-1 Manual.

D 6½. **SEAL HARBOR,** Hancock Co. (Not given.) Small system for domestic supply only, built in '85; extended in '94. Engr., J. T. Gardiner, Albany, N. Y. (?) Seal Harbor Water Supply Co. leases the plant of the Seal Harbor & Shore Front Water Co. Supply, Jordan's Pond, by gravity. Pond is 2 miles from and 270 ft. above village and is located in town of Mt. Desert. Surface pipe used for summer service only. Mains, about 7 miles. Taps, 50; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Pressure, 100 lbs. Cost, $20,000. Prest., Geo. L. Stebbins; Treas., R. M. Hoe, both of 102 Produce Exchange, N. Y. City; Supt., R. E. Campbell. Has private sanitary sewers.

47. **SKOWHEGAN,** Somerset Co. (5,068.) Built in '87-8 by Skowhegan Water Co. About '50, Aqueduct Co introduced (domestic?) supply. Several other pipe lines were subsequently added. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington. STAND-PIPE.—Cap., 975,000 galls.; 25 × 75 ft. DISTRIBUTION.—Mains, 10 miles. Meters, 3. Hydrants, 75. CONSUMPTION.—(Galls.) av., 125,000. FINANCIAL.—Cost, $116,000. Debt, $86,500: Floating, $8,500 at 6%. Bonded debt, $78,000 at 5%. Expenses, $5,962: Operating, $1,656; int., $4,250; taxes,

$56. Revenue, $4,034; Consumers, $2,100; City, fire protection $1,734; other purposes $200. SEWERS.—Has some. NOTE.—No report since 1890-1 Manual.

48. **SORRENTO,** Hancock Co. (Not given.) Built in '87 by Long Pond Water Co., which (apparently) is controlled by Frenchman's Bay & Mt. Desert Land & Water Co. FRANCHISE.—Does not provide for purchase of works by nor regulation of rates by city. Co. is exempt from local taxes. SUPPLY.—Long Pond, by gravity, through 7 miles of 8 and 12-in. pipe. Pond is 5 miles from village and 230 ft. above sea. Reported that first supply main was of 4-in. pipe, laid on surface; that heat from sun gave water tarry taste from pipe coating; and that a new main, 12, 10, 8 and 6-in. in diam., was laid in '95. RESERVOIR.—(In '89.) Cap., 90,000 galls.; 150 ft. above sea. DISTRIBUTION.—Mains, 7 miles; cost extensions met by Co. Hydrants, public, 12. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $65,000. MANAGEMENT.—Prest., Frank Jones, Portsmouth, N. H.; Vice-Prest., G. W. Armstrong, Brookline, Mass.; Treas., H. T. Gould, Boston; Supt., W. H. Lawrence. Rept. by Supt., June 6. SEWERS—Has sanitary and storm sewers.

49. **SOUTH BERWICK,** York Co. (1,803.) Built in '93 by South Berwick Water Co.; put in operation Jan., '94. Engr., C. H. Burleigh. Contr., William Flynn. FRANCHISE.—50 yrs. from '92; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay $800 per annum for public service. SUPPLY.—Brook, fed by springs, pumping with windmills and steam; filtered through sand. PUMPS.—Cap., 1,152,000 galls.; 2 Deane. Bituminous coal used; av. cost, $4 per short ton. RESERVOIRS.—Cap., 3,500,000 galls; 3 storage, 3,000,000, 1 distributing, 500,000. Reported that embankment to one of the reservoirs gave way, letting out 400,000 galls. of water. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 3 miles. Taps, 125; made by Co. at cost. Services, iron; paid for by consumer. Meters: 2; owned by consumer; controlled by Co.; repairs paid by consumer. Use of meters optional with consumer, except compulsory for schools and shoe factory. Hydrants, public, 14; private, 1. PRESSURE.—Ordinary, 75 to 90 lbs. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Treas., W. A. Burleigh; Supt., John M. Burleigh; Ch. Pump. Engr., Frank Sanborn. Rept. by Supt., Nov. 9, '96.

D 7. **SOUTH NORRIDGEWOCK,** Somerset Co. (Norridgewock town, 1,656.) Built in '88 by Henry K. Sawyer. Supply, spring, pumping to tank. In '88 there were one mile of mains and 50 consumers.

37. **SOUTH PARIS,** Oxford Co. (Not given.) Supply from Norway.

50. **SOUTH WEST HARBOR,** Hancock Co. (Not given.) Built in '95 by South West Harbor Water Co. Engrs., Isley & Cummings, Portland. FRANCHISE.—Co. is not exempt from local taxes. City to pay $80 per hydrant per yr. SUPPLY.—Artesian well, pumping to stand-pipe. PUMPS.—Wind-mill and gasoline engine, deep well pump. STAND-PIPE.—Cap., 120,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, made by consumer. Services, 1 in.; paid for consumer. Hydrants, public, 4. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock authorized, $25,000; paid-up, $10,000. Bonded debt, $7,000 at 6%; due in 10 yrs. from issuance. Expenses, Operating, $200. MANAGEMENT.—Prest., J. D. Phillip; Secy., Geo. R. Fuller; Treas., J. H. Pease; Supt., Geo. H. Gelly. Rept. by Geo. R. Fuller, Aug. 15.

D 8, 51. **SPRINGVALE,** York Co. (Est., 1,500.)

BUTLER SPRING WATER CO.

Built in '89 by Butler Spring Water Co. I. A. Butler, owner. Supply, springs, pumping to tank, with 100,000-gall. Silsby water power pump. Reservoirs, Cap., 60,000 galls.: storage and distributing, 30,000 each. Tank, Cap., 30,000 galls. Fiscal Year Closed Dec. 31. Mains, 3½ miles. Taps, 110; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, 0; private, 2. Consumption, av., about 22,000 galls. Pressure, Ordinary, 30 lbs. Cost, $9,000. Cap. Stock authorized, $10,000; all paid-up; no divi'd declared, net revenue being used for improvements. Debt, none. Expenses: Operating, very small. Revenue: Consumers, $700 to $800. Prest., I. A. Butler; Secy., Treas. and Supt., F. A. Clark. Rept. by Co., Aug. 20.

SPRINGVALE AQUEDUCT CO.

Built in '76; franchise, 30 yrs. from '78. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. Supply, Littlefield's pond, by gravity. Pond covers 40 acres; 1¼ miles from and 167 ft. above village. Mains, 4 miles. Taps, 150; made by Co. Services, iron; paid for by house-owners. Meters, 0. Hydrants, public, 8. Pressure, Ordinary, 80 lbs. Cost, $11,000. Cap. Stock, authorized, $12,000. Expenses: Operating, $200. Prest., C. H. Frost; Secy. and Supt., C. H. Pierce; Treas., J. B. Ricker. Rept. by Treas., Oct. 7. Has storm sewers only.

D 9. **SQUIRREL ISLAND,** Lincoln Co. (Not given.) Built in '93 by Squirrel Island Association, which also own the land. No Engr. Supply, Well, elevated by wind-mill and small Worthington pumps to 50,000-gall. tank, or tanks, at 75 ft. elevation. Mains, 2½ miles; galv. i. pipe laid on ground. No house connections are made but faucets are conveniently arranged along the lines of pipe and no charge is made for the use of the water. FINANCIAL.—Cost, $5,000. Rept. by Josiah S. Maxcy, Gardiner, Me., Sept. 3.

44. **THOMASTON,** Knox Co. (3,009.) Supply from Rockland.

52. **UNION,** Knox Co. (1,436.) Built in '95 by Union Water Co.; put in operation in Oct. Co. is exempt from local taxes for 10 yrs. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 100,000 galls.; ¾ mile from city. FISCAL YEAR CLOSED Apr. 25, '96. Taps, 50; made by Co. Services, galv. i.; paid for by owner. Meters: 0; Co. can compel use of meters and any consumer may have one. Hydrants, public, 8. PRESSURE, 65 to 70 lbs. FINANCIAL.—Cost, $9,000. Cap. Stock, authorized and paid-up, $10,000. Bonded debt, none. Revenue, City, fire protection, $75. MANAGEMENT.—Prest., F. A. Alden; Secy. and Supt., B. Burton; Treas., O. A. Burkett. Rept. by B. Burton, June 25.

10. **UPPER STILLWATER,** Penobscot Co. (Not given.) Supply from Public Works Co. Brewer.

10. **VEAZIE,** Penobscot Co. (650.) Acquired in '91 by Public Works Co. (See Brewer.) Built in '90 by Penobscot Water & Power Co. H. F. Sparks, Brewer, Me., and B. S. Whitney, Gardiner, Me., Engrs. FRANCHISE.—20 yrs. from '90. Rates to be same as in Bangor. Co. not exempt from local taxes. City to pay $41.66⅔ per hydrant per yr. SUPPLY.—Penobscot River, pumping direct. PUMPS.—Cap., 4,000,000 galls. Worthington water power, 2,000,000; auxiliary Deane steam, 2,000,000. Cumberland coal used; av. cost, $3.57 per short ton. FILTERS.—Cap., 4,000,000 galls.; Mechanical, gravel. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 3½ miles. Taps, 58; made by Co. free. Services, lead and galv. i.; paid for by Co. to property line. Meters, 0. Use of meters optional with consumer. Hydrants, public, 15; private, 1. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. FINANCIAL.—Revenue: City, fire protection, $625; other figures included in Public Works Co.'s plants, cannot be separated. MANAGEMENT.—(See Brewer.) Ch. Pump. Engr., J. G. Kimball.

P 3½. **WARREN,** Knox Co. (Town, 2,037.) Press rept., Jan., '97, stated Wm. F. Wight had applied to legislature for charter for Co. Supply, springs, by gravity.

53. **WATERVILLE AND FAIRFIELD,** Kennebec Co. (Waterville, 7,107; Fairfield, est., 5,000.) Built in '87 by Waterville Water Co.; sold in '91 to Maine Water Co. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $40 per hydrant per annum. SUPPLY.—Messalonskee River in Waterville, pumping to reservoir. PUMPS.—Blake, 2,500,000; Deane, 2,000,000. RESERVOIR.—Cap., 3,000,000 galls.; distributing. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 27 miles; cost extensions met by bonds and earnings. Taps, 1,500; made by Co. Services, galv. i.; paid for by consumer. Meters: Not given; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for manufactories. Hydrants, public, 90. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,300,000; min., 650,000. PRESSURE.—Ordinary, 85 lbs. Steam fire engines are used for fires outside of service limits. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Arthur Sewall, Bath,; Secy., G. A. Farrington, Gardiner; Treas., Josiah S. Maxcy, Gardiner; Supt., Everett M. Stacy; Ch. Pump. Engr., J. M. Rockwood. Rept. by Treas., June 15. SEWERS.—Has sanitary and storm sewers.

41. **WESTBROOK,** Cumberland Co. (6,682.) Supply from Portland.

P 4. **WEST SULLIVAN,** Hancock Co. (Sullivan, town, 1,379.) Surveys for works have been made.

F 4. **WILTON,** Franklin Co. (1,622.) Built in '95 by Wilson Lake Water Co., for fire protection. Supply, Wilson Lake, pumping with Gould rotary pump No. 5. Mains, 500 ft. Hydrants, 4. Pressure, 80-100 lbs. Cost, $1,500. Sinking Fund, $200. Prest. and Pump. Engr., G. R. Fearnald; Secy., Z. E. Hiscock; Treas., H. R. Dascom. Rept. by C. Fenderson, Sept. 2.

55. **WINTER HARBOR AND GRINDSTONE NECK,** Hancock Co. (Est., 1,709.) Built in '91 by Grindstone Neck Water Co. Supplies Gouldsboro and Grindstone Neck. SUPPLY.—Birch Harbor Pond, pumping to stand-pipe. PUMPS.—Cap., 350,000 galls. Holly comp. dup. STAND-PIPE.—Cap., 28,000 galls.; 8 × 75 ft. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 3 miles. Taps, 501; made by Co. Meters, 0. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 90,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock, $25,000. No debt. MANAGEMENT.—Prest. and Treas., C. H. Eicks, 80 Broadway, N. Y. city; Clk. and Gen. Supt., C. C. Hutchings, Winter Harbor; Ch. Pump. Eng., M. J. Harmon. Rept. by Gen. Supt., Sept. 30. SEWERS.—Sanitary system, with flush tanks.

56. **WINTERPORT,** Waldo Co. (1,926.) Under construction in '96 by Winterport Water Co.; owned by W. H. Hayden & Co., Bath, Me., who were Engrs. and Contrs. CONTRACT.—20 yrs. from '96. Co. is exempt from local taxes. City to pay $1,000 per yr. for 20 hydrants. SUPPLY.—Low's Brook, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; Worthington comp. RESERVOIRS.—Cap., 75,000,000 galls. STAND-PIPE.—Cap., 200,000 galls.; top is about 160 ft. above Main St. DISTRIBUTION.—Mains, 4½ miles; Hydrants, public, 20. PRESSURE.—67 to 84 lbs. FINANCIAL.—

Revenue: City, $1,000. MANAGEMENT.—Address owners. Rept. by B. P. Hall, Town Clerk, and Fred Atwood, formerly Prest. of Co.

F 5. **WINTHROP,** Kennebec Co. (2,111.) Built in '83 by town and private subscription, for fire protection only. Pumps at Woolen Mill.

57. **YARMOUTH,** Cumberland Co. (2,098.) Put in operation Jan. 1, '96. In '95 town bought charter of Yarmouth Water Co. and built works. SUPPLY.—Forest Paper Co. pumps the water from a spring on their property to a stand-pipe for $1,550 a yr. STAND-PIPE.—Cap., 264,000 galls. Steel 30 × 50 ft., on 12 posts 50 ft. high on natural stone foundation; total height, 100 ft. DISTRIBUTION.—Mains, 7 miles; cost extensions met by appropriations. Taps, 200; made by town. Services, galv. 1.; paid for by town to curb line. Meters, 0. Hydrants, public, 53; private, 3. CONSUMPTION.—(Galls.) av., 40,000. FINANCIAL.—Cost, $33,000. Bonded debt $35,000 at 4%; due in 1926. Expenses: int., $1,400; taxes, none. Revenue: Consumers, unmetered, $200. MANAGEMENT.—Selectmen; Supt. and Treas., John H. Humphrey. Rept. by John H. Humphrey, June 25. SEWERS.—About 2 miles of (storm?) sewers in business part of city.

58. **YORK BEACH AND YORK CLIFFS,** York Co.. (York, town, 2,444.) Present works built in '93 by York Water Co. In '88 York Beach Water Co. built works for domestic supply, which in '90 included wells, pump, tank, 3 miles of mains and 60 taps, and had cost $8,000. Reported in '93 that this plant was bought by York Water Co. FRANCHISE.—York Cliffs, perpetual; no franchise for York Beach. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $25 per hydrant per annum at York Cliffs. No public service at York Beach. SUPPLY.—Outlet of Lake Chase and well, by pumping. PUMPS.—Cap., 150,000 galls.; Smith-Vaile, 75,000; Davidson, 75,000. Bituminous coal used. TANKS.—Cap., 40,000 galls.; two, of wood, 25,000 galls. and 15,000 galls., resp. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 4.5 miles; cost extensions met from income and loans. Taps, made by Co. Services, iron and lead; paid for by owner of property. Meters, 0. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 100,000. Mostly a summer consumption, from April to Nov., inclusive. PRESSURE.—Ordinary, 65 lbs. FINANCIAL. Cost, $28,000. Cap. Stock, authorized, $100,000. MANAGEMENT.—Prest., J. D. Vermeule, 508 Broadway, N. Y. City; Secy., Saml. W. Jenkins, York Corner; Treas. and Supt., C. C. Vermeule, 71 Broadway, N. Y. City; Ch. Pump. Engr., Mark Hutchins. Rept. by Supt., July 15. SEWERS.—York Cliffs has sanitary sewers.

NOTE.—Since the above was put in type a rept. has been received from C. C. Vermeule stating that the York Water Co. bought the plant of the York Beach Water Co. in '92, extending it to supply York Cliffs, a summer resort just north of York Beach, considerably more than doubling the pipe and capacity of the old Co.'s works. York Water Co. now supplies the larger part of York Cliffs. Mr. Vermeule was Engr. for extension.

YORK SHORE WATER CO.

59. Built during spring of '96. Supplies the southerly extension of York Beach and York Harbor, four miles southward. Does not compete with the York Water Co., as the former Co. supplies consumers on higher level, maintaining a greater pressure. Prest., Josiah Chase, York Corner. Rept. by C. C. Vermeule, Jan. 4, '97.

NEW HAMPSHIRE.

47. **ALLENSTOWN,** Merrimack Co. (1,475, town.) Supply from Suncook.

1. **ALTON,** Belknap Co. (1,372.) Built in '98 by Alton & Alton Bay Water Co. Contrs., F. D. Mayo & Co., Lynn, Mass. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $800 per annum for public service. SUPPLY.—Gravity. RESERVOIR.—Cap., 250,000 galls. FISCAL YEAR CLOSED June 15. DISTRIBUTION.—Mains, 4 miles; cost extensions met by new stock. Taps, 150; made by Co.; no charge. Services, galv. 1.; paid for by Co. to the street line. Meters, 0. Use of meters optional with Co. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 90 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $30,750. Cap. Stock, authorized, $30,750; all paid-up; paid 5% div'd in '96. Expenses, $425: Operating, $200; taxes, $225. Revenue, $1,619: Consumers, unmetered, $800; City, fire protection, $800; public buildings, $19. MANAGEMENT.—Prest., F. J. Cushing, Lynn, Mass.; Secy., C. H. Downing, Alton Bay; Treas., H. J. Jones, Alton. Rept. by H. J. Jones, July 1.

2. **ANTRIM,** Hillsborough Co. (1,248.) Built in '93 by South Antrim village. Engr., S. Wadsworth; Contrs., E. Gustine & Son. SUPPLY.—Campbell pond, by gravity. Pond is 2 miles from and 200 ft. above village (press reports). DISTRIBUTION.—Mains, 6½ miles; cost extensions met by income. Taps, 100. Services, galv. 1.; paid for by consumer. Meters, 0. Hydrants, public, 38; private, 4. PRESSURE.—Ordinary, 95 lbs. FINANCIAL.—Bonded debt, $10,000 due 1902; $5,000 due 1907, $8,000 due 1912, all at

4%. Operating, none; int., $920. MANAGEMENT.—Board of Comrs.; Prest., E. W. Baker; Treas., C. H. Martin. Rept. by Henry Simonds. SEWERS.—Has storm sewers.

3. **ASHLAND,** Grafton Co. (1,193.) Present works built in '94 by town. Engr., F. A. Gay, Manchester; Contr., none. Press rept. states that town bought out Ashland Water-Works Co. in '94; probably domestic plant. SUPPLY.—(Press rept.) Jackson pond, by gravity from impounding reservoir on outlet, 9,000 ft. from, 200 ft. above village; also small dam at pond. FISCAL YEAR CLOSED Feb. 15. DISTRIBUTION.—Mains, 1¾ miles; cost extensions met by notes on demand. Taps, 100; made by town. Services, galv. i.; paid for by town. Meters: 4; owned and controlled by town; repairs paid by consumer. Use of meters compulsory for mills. Co. can compel use of meters and any consumer may have one. Hydrants, public, 40; private, 6. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $30,000. Debt, $30,000 at 4%. Expenses, $1,570: Operating, $100; int., $1,200; taxes, $270. Revenue $1,047; Consumers, unmetered, $737; metered, $185; City, fire protection, $125. Town appropriates $1,000 each year for the works. MANAGEMENT.—Supt., Frank Fifield; Rept. by Supt., June 22.

4. **BARTLETT,** Carroll Co. (1,247.) Press rept., Feb., '97, stated works had been bought by precinct at appraised valuation of $5,100; also that new supply would be introduced at cost of $20,000. Built in '86-7 by Bartlett Water Co. SUPPLY.—Mountain brook, by gravity. DISTRIBUTION.—Mains, 1.8 miles. Taps, 70. Hydrants, 17. PRESSURE.—Ordinary, 50. FINANCIAL.—Cost, $4,000. Cap. Stock, $3,000. Expenses: Operating, $100. MANAGEMENT.—Prest., N. P. Watson. NOTE.—No report since '90-1 Manual.

5. **BELMONT,** Belknap Co. (1,142.) Built in '94 by town. Engrs. and Contrs., Michigan Pipe Co. Press rept. states that at town meeting early in '93 town voted to buy franchise and property of Belmont Aqueduct Co., in case Co. built works within 1 yr. from Aug., '93. Co. apparently in existence July, '95. SUPPLY.—Artesian wells, by pumping. PUMPS.—Driven by aermotor. DISTRIBUTION.—Mains, 2 miles. Taps, 50; made by town. Services, iron. Meters, 0. Town can compel the use of meters and any consumer may have one. Hydrants, public, 21; private, 5. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $12,000. Expenses, operating, $5,000. MANAGEMENT.—Supt., Chas. O. Judkins. Rept. by Sept., June 20.

D 1, D 2. BERLIN, Coos Co. (3,729.)

BERLIN AQUEDUCT CO.

Built in '92. Engr., N. C. Perkins. Contrs., Madigan & Wanner. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. Co. not exempt from local taxes. City to pay $1,876 per year; contract for fire protection for 20 years. SUPPLY.—Bean Brook, by gravity, and Androscoggin River, by pumping. PUMPS.—Cap., 1,500,000 galls.; Deane. RESERVOIR.—Cap., 3,000,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—10 miles. Taps, 450; made by Co. for $10. Services, galv. i.; paid for by Co. to street line. Meters: 8; owned by Co. and consumer; controlled Co.; yearly rental, 15% of cost. Use of meters compulsory for mills, factories and stores, and may be made so for other consumers; any consumer may have a meter. Hydrants, public, 46. PRESSURE.—60 to 125 lbs. FINANCIAL.—Cap. Stock, authorized, $100,000; paid-up, $98,000; Bonded debt, $60,000 at 5%; due, 1912. MANAGEMENT.—Prest., W. C. Perkins; Clerk and Treas., J. F. Libby; Supt., N. Graves. Rept. by Clerk. SEWERS.—Has sanitary sewers.

GREEN AQUEDUCT CO.

Built for domestic supply when town was small. Supply, spring, through 2-in. pipe. Families supplied, about 100. Co. is not chartered. Supt., J. B. Noyes. Rept. by J. F. Libby, Treas., Berlin Aqueduct Co., who states that the two Cos. are not competitors, supply different districts, the old one making no extensions.

6. **BETHLEHEM,** Grafton Co. (1,267.) Built in '79 by Crystal Spring Water Co. SUPPLY.—Springs, by gravity from receiving and distributing reservoirs. RESERVOIRS.—Total cap., not given; receiving, 250,000 galls. DISTRIBUTION.—Mains 4.7 miles. Taps, 55. Hydrants, public, 9. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $21,000. No debt. Expenses: Operating, $400. Revenue, $1,400. NOTE.—No report since '90-1 Manual.

7. **BOSCAWEN,** Merrimack Co. (1,487.) Put in operation Jan., '93, by Boscawen and Penacook precinct. Most of Penacook is within city limits of Concord. A small part of Penacook, both within and outside Concord City limits, is supplied by this plant. Engrs. (surveys only), Bartlett, Gay & Young, Manchester; Contrs., Michigan Pipe Co., Bay City, Mich. SUPPLY.—Great Pond, in Boscawen and Webster, by gravity. DISTRIBUTION.—(As contracted for in '92.) Mains, 11 miles. Hydrants, 40. FINANCIAL.—Contract price, $65,000. MANAGEMENT.—Comrs. Supt., S. Buxton, Penacook.

8. **BRISTOL,** Grafton Co. (1,524.) Built in '86 by Bristol Aqueduct Co. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. Co. is not exempt from local taxes. City to pay $30 per hydrant per annum. Contract with the fire district was for 10 years; expired Nov. 1, '96. SUPPLY.—Newfound Lake, by

gravity. FISCAL YEAR CLOSED June 2. DISTRIBUTION.—Mains, 6 miles. Taps, 175. Services, galv. i. and rustless iron; paid for by consumer. Meters, 0. Hydrants, public, 33; private, 2. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 54 lbs. FINANCIAL.—Cost, $22,000. Cap. Stock, authorized, $22,000; all paid-up; paid 6% div'd. Expenses: Operating, $500; taxes, $313. Revenue, $3,000; Consumers, unmetered, $2,000; City, for all purposes, $1,000. MANAGEMENT.—Prest., Benj. F. Perkins, Secy. and Treas., M. W. White; Supt., S. D. Fellows. Rept. by Secy., June 13. SEWERS.—Has sanitary and partial system storm sewers.

9. **CANAAN,** Grafton Co. (1,417.) Built by Crystal Lake Water Co.; put in operation Jan. 1, '91. SUPPLY.—Crystal Lake, by gravity. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains (In '90), 1.5 miles. Hydrants, public, 9. FINANCIAL.—Cost, $19,000. Cap. Stock, authorized, $20,000; paid-up, $13,000. MANAGEMENT.—Prest., W. B. Richardson; Secy., C. O. Barney; Treas., A. E. Barney; Supt., O. L. Rand. Rept. by Supt., Sept. 25.

P 1. **CHESTER,** Rockingham Co. (958.) Works projected. Legislative authority secured. Supply to be from wells. Probable cost, $5,000. Engr., A. W. Dudley, Exeter.

10. **CLAREMONT,** Sullivan Co. (5,565.) Built in '87-8 by Claremont Water-Works Co. FRANCHISE.—Town had right to buy plant within five years after construction, at appraised valuation, but did not exercise the option. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $35 per hydrant per annum. SUPPLY.—Two brooks, by gravity. RESERVOIRS.—Cap., 28,000,000 galls.; three; 2 impounding, 2,750,000 and 3,250,000, respectively, 1 storage, 22,000,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by income. Taps, 600; made by Co. Services, galv. i. and cement lined; paid for by Co. to street line. Meters, 51; owned, controlled and repaired by Co. Co. can compel the use of meters and any consumer may have one if he pays over $12 per year. Hydrants, public, 57; private, 13. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 65 lbs.; fire, 135 lbs. FINANCIAL.—Cost, $110,000. Cap. Stock, authorized, $150,000. Bonded debt, $75,000, at 5%. Revenue, $9,000; City, fire protection, $2,000; other purposes, $7,000. MANAGEMENT.—Prest., Hon. Ira Calby; Secy., E. H. Carpenter, Manchester; Treas., Geo. H. Stowell; Supt., Jas. L. Rice. Rept. by Supt., June 5.

11. **COLEBROOK,** Coos Co. (1,736.) Built in '79-82 by G. W. Annis. SUPPLY.—Springs, by gravity from collecting reservoirs. RESERVOIRS.—Cap., 60,000 galls.; 3; Elev., 200 ft., 170 ft. and 75 ft., respectively, above village. Taps, 100. Services, galv. i. Hydrants, public (in '90), 9. PRESSURE.—Ordinary, 20 lbs. FINANCIAL.—Cost, $16,000 to $18,000. MANAGEMENT.—G. W. Annis. Rept. by owner, June 20.

12. **CONCORD,** Merrimac Co. (17,004.) Built in '72-3 by city of Concord. Extended to West Concord and Penacock in '87. These sections, however, are within city limits, except small part of Penacook, across Contoocook River. Part of this small trans-river section of Penacook is supplied by Boscawen and Penacook precinct. High service for a portion of the city added in '91 and '92. SUPPLY.—Penacook Lake, area 265 acres, by gravity for part of the city and pumping to the remainder. Crest of dam at lake 185 ft. above Merrimack River, and 125 ft. above Main St., at State House; dam 3½ miles from State House. Intake: Brick, 24 x 30 ins., extending 1,950 into (or beneath?) lake. Supply main: 14 in. w. i. and cem., 3½ miles long, with gates at each end. PUMPS.—Cap., 2,900,000 galls. Worthington 6-cylinder triple expansion. Pocohontas coal used; av. cost, $4.25 per short ton. RESERVOIRS.—Cap., 2,000,000 galls.; distributing. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 56 miles; cost extensions met by earnings and bonds. Taps, 3,055; made by city, free. Services, cement lined; paid for by city to curb line. Meters: 389; nearly all owned by city; controlled and repaired by city. Use of meters compulsory for railways, factories, etc. City can compel the use of meters and a consumer may have one. Hydrants, public, 243; private, 30. PRESSURE.—Ordinary, 45 lbs.; fire, 83 lbs. Steam fire engines are used. FINANCIAL.—Cost, $840,057; Bonded debt, $690,000, due during 26 yrs. of which $35,000 is at 3½%, remainder at 4%. Expenses, $32,731: Operating, $5,581; int., $27,150. Revenue, $55,249: Consumers, unmetered, $33,337; metered, $14,719; City, fire protection, $6,000; street sprinkling, $700; public buildings, $183; watering troughs, $200; cemeteries, $90; other purposes, $20. MANAGEMENT.—Water Comrs. Prest., Wm. P. Fiske; Supt., V. C. Hastings. Rept. by Supt., June 23. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Mar. 11, '82; Worthington pump, Sept. 21, '93.

13. **CONWAY,** Carroll Co. (2,331.) Built in '90 by Conway Aqueduct Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $400 per annum hydrant rental for 10 yrs. SUPPLY.—Natural springs and Cold Brook, by gravity. RESERVOIR.—Cap., 100,000 galls. FISCAL YEAR CLOSED Aug. 1, '95. DISTRIBUTION.—Mains, 5.5 miles; cost extensions met by earnings. Taps, 135; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 24; private, 4. PRESSURE.—45 to 50 lbs. FINANCIAL.—Cost, $16,323. Cap. Stock, authorized, $15,000; paid-up, $13,000; paid 12% div'd in '95. Expenses: Operating, $150; taxes, $109. Revenue, $1,713. MANAGEMENT.—

Prest., H. B. Fifield; Secy. and Treas., C. W. Wilder; Supt., B. F. Clark. Rept. by Secy., July 8. SEWERS.—Has storm sewers.

14. **DERRY,** Rockingham Co. (2,604.) Built in '90 by Derry Water-Works Co., under perpetual franchise. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000-gall. Knowles dup.; one comp., one high pressure. STAND-PIPE.—Cap., 189,400 galls.; iron, 30 × 35 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 6.77 miles. Taps, 265; made by Co., free. Services, galv. i.; paid for by Co. to street line. Meters: 5; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturers and mechanical consumers. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., 81,159; Max., 119,740; min., 47,214. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $91,988. Cap. Stock, paid-up, $50,000. Bonded debt, $35,000, at 5%, in excess of sinking fund. Sinking fund is invested in bonds of Co. Expenses, $4,000. Revenue, $5,450: consumers, unmetered, $3,250; city, $2,200. MANAGEMENT.—Prest., Wm. S. Pillsbury; Secy., Prof. C. S. Campbell; Treas., F. J. Shepard; Supt., John White. Rept. by Wm. Wheeler, Supervising Engr., 89 State St., Boston, Mass., Oct. 5

15. **DOVER,** Strafford Co. (12,790.) Built by city in '88; new works built in '88-9. When city bought works three Co.'s supplied town; Dover Landing Aqueduct Co., organized in '26; Cocheco Aqueduct Association, organized in '32; and Dover Aqueduct Co., date not given. SUPPLY.—Springs, well and gallery, reinforced by Willand pond, pumping to reservoir. Gallery wood-lined, 178 ft. long, 5 ft. wide, 9 ft. deep, covered with pitch roof. PUMPS.—Blake. RESERVOIR.—Cap., 2,000,000; high water 284 ft. above mean low tide and 163 ft. above engine room floor. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 22.6 miles. Taps, 1,684. Meters, 320. Hydrants, public, 168. CONSUMPTION.—(Galls.) av., 565,803. PRESSURE.—Ordinary, 65 to 115 lbs. FINANCIAL.—Cost, $356,846; $67,500 was paid to Cocheco Aqueduct Co., $20,000 to Dover Aqueduct Co. and $13,000 to Dover Landing Aqueduct Co. for their works, or $100,000 in all. Debt, $326,500, at 4½% due in 50 yrs. Expenses, $26,598; int., $13,980. Revenue, $30,098. MANAGEMENT.—Three Comrs. Prest., Joseph G. Whittemore; Clk., Chas. A. Fairbanks; Supt., Williard T. Sanborn, appointed by Comrs. Rept. by Clk., Oct. 31. SEWERS.—Partially sewered. REFERENCES.—Eng. News, Sept. 8, '83; available supply, Nov. 26, '87.

D 3. **DREWSVILLE,** Cheshire Co. (Est. 100.) Domestic works built in '04 and rebuilt in '76 by Drewsville Water Co., a mutual concern. Supply, spring, by gravity to reservoir 2,475 ft. 1½-in. galv. i. and wood pipe. Between 10 and 20 consumers. Supt., Jos. Fisher.

45. **EAST ROCHESTER,** Strafford Co. In town of Rochester, which see.

16. **EXETER,** Rockingham Co. (4,284.) Built in '86-7 by Exeter Water-Works Co., under perpetual charter. SUPPLY.—Well and Wheelwright's brook, pumping to stand-pipe. Well is 40 × 25 ft. PUMPS.—Cap., 2,000,000 galls.; Worthington, one single high pressure, one comp. cond., 1,000,000 each. FILTERS.—100,000-gall. National (New York) and Jewell filter. RESERVOIRS.—Impounding, formed by dam across Wheelwright's brook. Area, 19 acres. STAND-PIPE.—Cap., 220,000 galls.; 25 × 60 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 11.21 miles. Taps, 649; made by Co. free. Services, galv. i.; paid for by Co. to street line. Meters: 13; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co. Hydrants, public, 57. CONSUMPTION.—(Galls.) av., 179,494; max., 228,000; min., 156,000. PRESSURE.—Ordinary, 55-60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $155,442. Cap. Stock, all paid-up, $90,000. Bonded debt, $42,000, at 5%; less sinking fund. Sinking fund is invested in bonds of Co. MANAGEMENT.—Prest., Edwin G. Eastman; Secy. and Supt., Chas. H. Johnson; Treas., Elbert Wheeler, 24 Washington St., Boston, Mass. Rept. by Wm. Wheeler, Supervising Engr., 89 State St., Boston, Mass., Oct. 5. SEWERS.—Has sanitary and storm sewers.

17. **FARMINGTON,** Strafford Co. (3,064.) Built in '71 by city. SUPPLY.—Springs, pumping to reservoir. PUMPS.—Knowles. DISTRIBUTION.—Mains, 3 miles. Taps, 160. Meters: 31. Hydrants, 28. MANAGEMENT.—Comrs. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, June 28, '84.

D 4. **FRANCESTOWN,** Hillsborough Co. (837.) Small domestic plant owned by S. S. Downs, Treas., and four others. Supply, spring, ⅝ mile from village, by gravity. Cost, about $1,000. Rept. by Treas.

18. **FRANKLIN AND FRANKLIN FALLS,** Merrimack Co. (4,085.) Now owned by town. First works built by Cold Brook Spring Water Co., date not given. Town bought these works, taking posession July 1, '91, and incorporating them in plant built by it in same year. SUPPLY.—Springs, pumping to reservoir. PUMPS.—Cap., 3,000,000 (?) galls. Annual report for '92 gives 500,000 galls. Deane pump, driven by 21-in. Hercules water wheel; no other pumps described officially. Press rept. stated that 1,000,000-gall. Knowles, located in mill, had just been tested in May, '93. RESERVOIRS.—Cap., 500,000 galls.; covered; 69 ft. in diam. at bottom, 71 at top, water 17 ft. deep. Masonry wall, covered with brick arches. DISTRIBUTION. — Mains, 9⅛ miles. Taps, 360. Services, lead lined, galv. i. and iron. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 218,000. FINANCIAL.—Cost, $100,000, of which $25,000 was

paid for Cold Brook Spring system and water supply. Bonded debt, $100,000, at 4%. Expenses, $6,318: Operating, $2,438; int., $3,880. Revenue, $5,292. MANAGEMENT.—Prest., Warren P. Daniell; Secy. and Mgr., Frank W. Parsons; Supt., E. L. Wallace. REFERENCE.—Covered reservoir, Eng. News, May 12, '92, illus.

18. **FRANKLIN FALLS,** Merrimack Co. See Franklin.

D 5. **GLEN,** Carroll Co. (Pop. not given.) Built in '95 by Glen Water Co., probably for domestic supply only; put in operation Jan. 1, '96. Engr. and Contr., O. S. Lucy. Supply, mountain springs, by gravity. Services, galv. i.; paid for by house owner. Daily consumption, av., 1,000 galls. Cost, $1,500. Prest., O. S. Lucy; Secy., J. F. Robinson; Treas., A. W. Burnell. Rept., Jan. 1, '97.

19. **GOFFSTOWN,** Hillsborough Co. (1,981.) Built in '91 by village. SUPPLY.—Impounding reservoir on mountain stream, by gravity. RESERVOIRS.—Cap., 2, 250,000 galls. (press rept.) Hydrants, public, 45. FINANCIAL.—Cost, $42,000. Bonded debt, $42,000. Revenue, $2,248. MANAGEMENT.—Water Comrs. Chn., O. B. Pierce; Secy., J. H. Conner; Treas., A. H. Parker. Rept by Secy., Sept. 28.

20. **GORHAM,** Coos Co. (1,710.) Built in '73 by Alpine Aqueduct Co. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. Co. is not exempt from local taxes. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 10,000 galls.; 130 ft. above and one mile from village. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by revenue. Taps, 309; made by Co. free. Services, galv. i.; paid for by Co. Meters, 0. Use of meters optional with consumer. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary, 56 lbs. FINANCIAL.—Cap. Stock, authorized, $25,000; paid-up, $23,200; paid 10% div'd. No floating debt. Expenses: Operating, $400; taxes, $158 in '95; $276 in '96. Revenue, $3,125: Consumers, unmetered, $2,963; City, fire protection, $132; other purposes, $30. MANAGEMENT.—Prest., Wallace Mason; Secy. and Treas., Thos. E. Fisk. Rept. by Secy., June 5. REFERENCE.—Eng. News, Apr. 5, '84.

46. **GREAT FALLS,** Strafford Co. Now Somersworth, which see.

F 1. **GREENVILLE,** Hillsborough Co. (1,255.) Built in '90 by town and Columbia Mfg. Co., for fire protection, only. Supply, Souhegan River, pumping to tank. Cost, $3,900. Chn., Wm. C. Greene.

21. **GROVETON,** Coos Co. (Est., 700.) Built in '90 by Groveton Water Co.; sold in '94 to the Northumberland Water Co. who rebuilt and extended it in '95. SUPPLY.—Springs, by gravity. DISTRIBUTION.—Mains, 4.16 miles. Taps, 135. Hydrants, public, 35. PRESSURE.—Ordinary, 80 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock, $20,000: authorized, all paid-up. Bonded debt, $15,000. MANAGEMENT.—Prest., C. C. O'Brien; Secy. and Treas., F. W. McDonald; Gen. Mgr., C. T. McNally. Rept. by Secy., Sept. 29.

22. **HANOVER,** Grafton Co. (1,817.) Present works built in '93 by Trustees Dartmouth College and Village, jointly, under name of Hanover Water-Works Co.; college owns $25,000 and village $20,000 of cap. stock. In '20, Hanover Aqueduct Co. built works for domestic supply. Engr. (new works), Prof. Robt. Fletcher, Hanover; Contr., Lucian A. Taylor, Boston, Mass. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Stream and springs, by gravity from impounding reservoir. RESERVIOR.—Cap., 116,000,000 galls. Has area of 32½ acres, drainage area of 1,225 acres, and is 155 ft. above Wheelock Hotel and 260 ft. above lowest point on line. FISCAL YEAR CLOSED June 5. DISTRIBUTION.—Mains, 7 miles. Taps, 160; made by Co. for $3. Services, enameled. Meters, 0. Hydrants, public, 40; private, 7. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—61-105 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock, authorized, $75,000; paid-up, $45,000; paid 5% div'd. Floating debt, $419, at 6%; Bonded debt, $20,000, at 5%; due '99-1924. Expenses: Operating, $312; taxes, $23. Revenue: Consumers, unmetered, $3,078; City, fire protection, $1,000. MANAGEMENT.—Prest., N. S. Huntington; Secy. and Treas., Perley R. Bugbee; Supt., E. P. Storrs. Rept. by Secy., June 12. SEWERS.—Has sanitary sewers, only. REFERENCE.—Eng. News, June 10, '82.

23. **HENNIKER,** Merrimack Co. (1,885.) Built in '82 by Henniker Spring Water Co. Co. is exempt from local taxes. SUPPLY.—Springs by gravity from reservoir. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 1 mile. Services, galv. i.; paid for by owner. Meters, 0. Hydrants, public, 6; private, 10. FINANCIAL.—Cap. Stock, authorized, $6,000; all paid-up; paid 4% div'd. Floating debt, $1,000. Expenses, int., $50. MANAGEMENT.—Prest., G. C. Preston; Treas., W. P. Folsom. Rept. by G. C. Preston, Aug. 20.

24. **HILLSBOROUGH BRIDGE,** Hillsborough Co. (2,120.) Now owned by fire precinct. Built in '87 by Hillsborough Water Co.; in Mar., '96, precinct voted to buy plant; town clerk states price agreed on was $45,000 and that fire precinct took possession Jan. 1, '97. FRANCHISE.—Was 10 yrs. from '87. Rates were not fixed in franchise nor subject to regulation by city. Co. was exempt from local taxes. City was to pay $1,000 per yr. for public service. SUPPLY.—Loon Pond, area, 600 acres, by gravity. RESERVOIR—Cap., 500,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains 8 miles.

Taps, 300; made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 36; private, 5. CONSUMPTION.—Unknown. PRESSURE.—83 lbs. FINANCIAL.—(In '90) Cost, $50,000. Cap. Stock, authorized, $25,000. Bonded debt, $25,000, at 5%. MANAGEMENT.—Prest., G. E. Gould; Clerk, Frank E. Merrill. SEWERS.—Has sanitary sewers only. NOTE.—Above rept. is for plant under private ownership, except as noted. Press rept. stated precinct would issue $45,000 4% bonds about Jan. 1, '97.

F 2. **HINSDALE,** Cheshire Co. (2,258.) Built in '84 by village for fire protection only. Supply from canal by pumping. Mains, 1¾ miles. Hydrants, 22. Chf. Engr. Fire Dept., N. H. Bardwell.

24½. **HOPKINTON,** Merrimack Co. (1,817, town.) Built by Hopkinton Village Aqueduct Association for general supply. "Water-works have been running here for over 40 yrs." (Rept. by H. F. Edmunds, Nov. 23.) SUPPLY.—Wells, on hill west of village, by gravity, from impounding reservoirs. RESERVOIRS.—Cap., not given; impounding, located in different parts of village for fire protection. MANAGEMENT.—Prest., G. W. Currier; Secy., H. F. Edmunds; Treas., W. C. Russ. Rept. by Prest., Jan. 12, '97. SEWERS.—Has storm sewers only.

25. **HUDSON,** Hillsborough Co. (1,092.) Built in '91 by Hudson Water-Works Co.; Engr. and Contr., G. O. Sanders. Co. is not exempt from local taxes. SUPPLY.—Open wells, near pond; can pump by water power. PUMPS.—Cap., 250,000 galls. Worthington. STAND-PIPE.—Cap., 50,766 gall.; iron, 12 × 60 ft. DISTRIBUTION.—Mains, 5¾ miles. Taps (in '90), 100. Services, paid for by consumer. Hydrants, public, 10. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Cost (in '90), $20,000. Cap. Stock, authorized, $20,000; Bonded debt, $20,000, at 5%; due in 20 yrs. MANAGEMENT.—Prest. and Supt., G. O. Sanders; Treas., L. P. Sanders. Rept. by Supt., July 8.

26. **KEENE,** Cheshire Co. (7,446.) Built in '69 by city and enlarged in '88. SUPPLY.—Two lakes, by gravity. Drainage area, about 1,900 acres. Separate conduit from each lake. RESERVOIRS.—Cap., 1,200,000 galls.; distributing. Press repts. in '92 stated that measurements by Supt. showed leakage of about 100,000 galls. per day, and that bottom had just been cemented. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 32½ miles; cost extensions met from city treasury. Taps, 1,535; made by water dept. for $9, ¾-in., $10, 1-in., $12, 1¼-in. Services, galv. i.; paid for by consumer, included in above rates. Meters: 80; owned, controlled and repaired by city. Use of meters optional with city; compulsory for large consumers. Hydrants, public, 199. CONSUMPTION.—(Galls.) av., 1,300,000. PRESSURE.—Ordinary, 60 lbs.; fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $304,919, of which $80,598.74 is for relaying cement-lined with cast-iron pipe. Bonded debt, $10,000, at 6%; due Oct. 1, '96; $35,000 at 5%, due Jan. 1, '99; $37,000, at 3½%, due 1913 and $45,000, at 4%, due 1917. Sinking Fund: $49,982, invested at 4%. Expenses: Operating, $2,463. Revenue, $17,591: Consumers, unmetered, $14,829; metered, $2,762. MANAGEMENT. — Three Comrs., one appointed every year by city council. Prest., N. G. Gurnsey; Supt., Paul F. Babbidge. Rept. by Supt., June 18. PROJECTED IMPROVEMENTS.—New source of supply. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 5, '81.

27. **LACONIA AND LAKE VILLAGE.** Belknap Co. (Laconia, 6,143; Lake Village, est., 3,000.) Built in '85 by Laconia & Lake Village Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are regulated by contract. SUPPLY.—Lake Winnipiseogee, pumping to reservoir. PUMPS.—Cap., 3,000,000 galls. Blake 1,000,000, Davidson 2,000,000. Bituminous and Cumberland coal used. RESERVOIRS.—Cap., 2,750,000 galls. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 22.61 miles. Taps, 1,443; made by Co. to street line. Services, cement lined; paid for by Co. to street line. Meters: 841; owned, controlled and repaired by Co. Use of meters compulsory for all services that pay $10 per annum or more. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 82; private, 10. CONSUMPTION.—(Galls.) av., 440,000. Pressure.—Ordinary, 86 lbs.; fire, 86 lbs. Steam fire engines are used. FINANCIAL.—Cost, $166,202. Cap. Stock, authorized, $75,000; paid 6% in '96. Bonded debt, $50,000, at 5%. Expenses ('94-5, from annual rept.), $10,128: Operating, $6,018; int., $2,884; taxes and insurance, $1,226. Revenue ('94-5, from annual rept.), $17,802: Consumers, $14,472; Sundries, $143; City, fire protection, $3,186. MANAGEMENT.—Prest., W. L. Meliker; Treas., Edmund Little; Supt., F. P. Webster, Lakeport; Ch. Pump. Engr., W. W. Webster. Rept. by Supt., Aug. 17. SEWERS.—Has sanitary and storm sewers. NOTE.—Press report, Jan. 11, '97, stated that city was discussing the question of buying the plant.

27. **LAKE VILLAGE,** Belknap Co. (Est., 3,000.) Supply from Laconia.

28. **LANCASTER,** Coos Co. (3,373.) Now owned by precinct. Date first supplied not given. In '72 Lancaster Aqueduct Co. rebuilt works for domestic supply. Village put in works, date not given, for fire protection. In '92 Lancaster Water Co. built present plant; Engr., E. H. Gowing, Contrs., Moore & Co., all of Boston. Press rept., Jan., '94, stated that new Co. had bought out old Aqueduct Co. for $6,000. Mar., '94, precinct voted to buy out Lancaster Water Co. Resolutions for purchase set forth that contract between Co. and precinct provided latter might buy works at any time prior to Jan. 1, '97, at cost of construction, plus 6% int. and 10% bonus, and less net earnings. Resolution for purchase left price to com. Precinct took possession June, '94. Press rept. states price

paid was about $70,000. SUPPLY.—Garland Brook, by gravity. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 12 miles; cost extensions met by earnings. Taps, 600. Services, galv. i.; paid for by consumer. Meters: 1; owned and controlled by Co. Hydrants, public, 62. PRESSURE.—80 lbs. FINANCIAL.—Cost, $80,000. Bonded debt, $70,000, at 4%. MANAGEMENT.—Prest., Geo. R. Eaton; Secy and Treas., W. E. Bullard; Supt., Burleigh Roberts. Rept. by Supt., Aug. 12. SEWERS.—Has sanitary and storm sewers.

29. **LEBANON,** Grafton Co. (3,763.) Built in '87 by Lebanon Center Village fire precinct. SUPPLY.—Mascoma River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Lang triplex plunger. RESERVOIRS.—Cap., 1,100,000 galls. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 11.5 miles. Taps, 525; made by village free, including service to street line. Services, galv. i.; paid for by consumer from street line. Meters, 32.; owned by consumer; yearly rental, $2. Use of meters optional with consumer. Hydrants, public, 63; private, 3. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 110 to 140 lbs. FINANCIAL.—Cost, $81,724 for construction and maintenance. Floating, $4,575, at 6%; Bonded debt, $40,000, at 4½%. Expenses, operating, $5,654. Revenue, $5,911: Consumers, $5,748; other purposes, $162. Interest on debt paid by taxation. MANAGEMENT.—Three Comrs., one elected every year. Chn., C. E. Lewis. Supt., H. P. Goodrich, appointed by Comrs.; Ch. Pump. Engr., C. P. Freeman. Rept. by Chn., July 14, and (for improvements) Dec. 28. PROJECTED IMPROVEMENTS.—Filter to be voted on next spring. SEWERS.—Partial sanitary system.

30. **LISBON,** Grafton Co. (2,060.) Built in '86 by Lisbon Water-Works Co. SUPPLY.—Pearl Lake, by gravity. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4 miles. Taps, 88. Services, w. i. Hydrants, public, 32. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $40,000. Cap. Stock, authorized, $20,000; all paid-up; Bonded debt, $22,000, at 5%; due 1908. Expenses: Operating, $209; int., $1,000. Revenue, $1,667: Consumers, $892; City, fire protection, $775. MANAGEMENT.—Prest., Chas. H. Bartlett; Secy., Edwin H. Carpenter; Treas., Jas. A. Weston, all of Manchester; Supt., L. C. Payne. Rept. by Supt.

31. **LITTLETON,** Grafton Co. (3,365.) Built in '79 by Littleton Water & Electric Light Co. SUPPLY.—Springs, by gravity and pumping to reservoir. PUMPS.—Cap., 1,250,000 galls. Two Worthington dup. water power, 500,000 and 750,000. Wood used; also water power. RESERVOIR.—Cap., 550,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 7 miles; cost extensions met by earnings. Taps, 300; made by Co. free. Services, iron or lead; paid for by consumer. Meters: 6; owned, controlled and repaired by Co. Use of meters compulsory for motors, railways and manufacturing. Co. connot compel, but may prohibit use of meters. Hydrants, public, 55; private, 2. CONSUMPTION.—(Galls.) av., 350,000; max., 500,000; min., 200,000. PRESSURE.—Ordinary, 110 lbs.; fire, 110 lbs. FINANCIAL.—(In '90) Cost, $100,000. Cap. Stock, authorized, $75,000; all paid-up; Bonded debt, $100,000. MANAGEMENT.—Prest., Geo. Wykes; Secy., Victor Cumberson; Treas., Hunter Wykes, all of 44 Wall St., N. Y. City; Supt., B. H. Corning. Rept. by Ch. Pump. Engr., July 18. SEWERS.—Has sanitary and storm sewers.

32. **MANCHESTER,** Hillsborough Co. (44,126.) Built in '72-4 by city. SUPPLY.—Lake Massabesic, area 2,500 acres, pumping to high and low service reservoirs. Lake front is being bought for sanitary protection of supply. PUMPS.—Cap., 16,000,000 galls. Wood, 5,000,000 water power; Davidson, 5,000,000 water power; 2—3,000,000 Worthington hor. comp. high duty for high service. Georges Creek coal used; av. cost, $3.50 per short ton. RESERVOIRS.—Cap., 19,000,000 galls. High service, 4,000,000; 152 ft. above city hall; low service, 15,000,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 85 miles; cost extensions met by receipts. Taps, 5,000; made by city, free. Services, lead lined; paid for by city. Meters: 2,520; owned, controlled and repaired by city. City can compel the use of meters and any consumer may have one. Hydrants, public, 672; private, 10. CONSUMPTION.—(Galls.) av., 3,500,000. PRESSURE.—60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,350,000; Bonded debt, $900,000, at 4, 4½, 5 and 6%. Sinking Fund: $43,000. Expenses: Operating, $35,000, includes laying over cement pipes; int., $42,620. Revenue, $120,300: Consumers, $34,000; metered, $67,500; City, fire protection, $15,800; public buildings, $3,000. MANAGEMENT.—Prest., Alpheus Gay; Secy., Henry Chandler; Treas. and Regtr., Arthur E. Stearns; Supt., Chas. K. Walker. Rept. by Regtr., June 5. REFERENCES.—Eng. News, July 16, '81; asphalt reservoir lining and high service supply, Sept. 5, '95, illus. NOTE.—New high service includes a 20-in. c. i. force main, 3.63 miles long. Engrs. for whole improvement, Rice & Evans, Boston.

33. **MEREDITH,** Belknap Co. (1,642.) Built in '94 by fire district; put in operation in Dec. Engr., Samuel M. Gray, Providence, R. I. Contr., E. Eugene Eglee, Flushing, N. Y. SUPPLY.—Brooks and springs, by gravity from impounding reservoir. RESERVOIR.—Cap., 10,000,000 galls. Formed by small dam. Surface 274 ft. above lake and 230 ft. above Main St. at town hall. FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 4¾ miles. Taps, 110; made by dist. Services, lead lined; paid for by dist. Meters: 15; owned and repairs paid by consumer; controlled by dist. Dist. can compel use of meters and any consumer may have one. Hydrants, public, 35; private, 2. PRESSURE.—Ordinary, 115 lbs. FINANCIAL.—Floating debt, $4,400, at 6%;

Bonded, $40,000, at 4½%. Expenses: Operating, $50. Revenue: Consumers, $1,175; City, fire protection, $1,130. MANAGEMENT.—Prest., Geo. F. Sanborn; Secy. and Treas., A. S. Clough. Rept. by Secy., Dec. 30. SEWERS.—Has partial sanitary and storm sewers.

34. **MERIDEN,** Sullivan Co. (Not given.) Built in '90 by Meriden Water Co. SUPPLY. —Springs, by gravity to reservoir. Springs are 200 ft. above highest point in village. RESERVOIR.—Cap., 256,000 galls. DISTRIBUTION.—Mains, 2.5 miles, w. i. Taps, 46. Services, w. i. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 1,200. FINANCIAL.—Cost, $3,750. Cap. Stock, $4,000. MANAGEMENT.—Prest., A. B. Chellis; Secy., J. S Wood; Treas., John T Duncan; Supt., E. R. Miller. Rept. by Supt., Sept. 25.

35. **MILFORD,** Hillsborough Co. (3,014.) Now owned by town. In '82 town built works for fire protection. In '89 Milford Water-Works Co. built works which were bought by town in '91. Franchise provided that city might buy works within one year at cost, plus interest and 5% bonus, or at any time afterward, within 20 years, at actual value. Engr., J. I. Langford. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., not given. New River coal used; av. cost, $4.75 per short ton. STAND-PIPE.—Cap., 250,000 galls.; 170 ft. above public square; covered (?). FISCAL YEAR CLOSED Feb. 15. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by income. Taps, 398; made by town for $10. Services, cement lined; paid for by owner. Meters: 48; owned, controlled and repaired by consumer. Use of meters compulsory for boarding houses, factories and stables. Town can compel the use of meters and any consumer may have one. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 97,232. PRESSURE.—Ordinary, 83 lbs. FINANCIAL.—Cost, $102,881; Bonded debt, $75,000. Sinking Fund: $6,521. Expenses, $5,124: Operating, $2,124; int., $3,000. Revenue, $7,207: Consumers, $3,778; City, fire protection, $2,385; sewer flushing, $7; public buildings, $287; other purposes, $72. Deficits are met by town appropriation. MANAGEMENT.—Prest., B. R. Cann; Secy and Treas., C. L. Wilkins; Supt. and Ch. Pump. Engr., John Robertson. Rept. by Secy. in Sept. SEWERS.—Partial sanitary system.

36. **NASHUA,** Hillsborough Co. (19,311.) Built in '55 by Pennichuck Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay at same rates as for private service. SUPPLY.—Pennichuck River, pumping direct and to reservoir. PUMPS.—Cap., 17,000,000 galls. Snow triple expansion, 8,000,000; Worthington, 3,000,000, comp. cond.; Holly power, 4,000,000; Lang power, 2,000,000; Georges Creek coal used; av. cost, $4.30 per short ton delivered. RESERVOIRS.—Cap., 4,000,000 galls. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 55 miles. Taps, 4,000; made by Co., including service to inside of cellar at cost. Services, galv. i. Meters: 300; owned, controlled and repaired by Co. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 215; private, 10. CONSUMPTION.—(Galls.) av., 3,500,000; max., 4,500,000; min., 3,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, paid-up, $600,000; paid 6% div'd in '95. Expenses, taxes, $10,000. MANAGEMENT.—Prest., John F. Stark; Treas., Harry M. Hobson; Supt., Horace G. Holden; Ch. Pump. Engr., Thos. H. Rogers. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 29, '81.

37. **NEWMARKET,** Rockingham Co. (2,742.) Built in '93 by private Co. Engr., J. F. Springfield. FRANCHISE.—Co. is exempt from local taxes. City to pay $2,000 per annum for public services. SUPPLY.—Springs (pumping to tank ?). TANK.—Cap., 235,000 galls.; iron, 40 × 25. DISTRIBUTION.—Mains, 10 miles. Taps, 300; made by owner for $3. Services, iron; paid for by owner. Use of meters optional with consumer. Hydrants, public, 50. PRESSURE.—Fire, 100 lbs. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Prest., O. A. Gibbs, Dover; Treas., J. F. Springfield, Boston. Rept. by Town Clerk, Aug. 14.

38. **NEWPORT,** Sullivan Co. (2,623.) Present works built in '94 by city. Supplied before that time by two private Co.s. Engr. and Contr., L. A. Taylor, Boston. SUPPLY. —Gilman's pond, 5½ miles from village, by gravity. RESERVOIR.—Cap., 700,000 galls., distributing. FISCAL YEAR CLOSED Feb. 15. DISTRIBUTION.—Mains, 10.4 miles; cost extensions met by taxation. Taps, 201; made by village. Services, cement lined iron; paid for by village to street line. Meters, 0. Hydrants, public, 50. PRESSURE.—80 to 135 lbs. One fire engine used. FINANCIAL.—Cost, $60,000. Bonded debt, $50,000, at 4%. Expenses: Operating, $850; int., $3,271. Revenue, $4,029: Consumers, $2,529; City, fire protection, $1,500. MANAGEMENT.—Three Comrs. Clerk, D. J. Mooney; Supt., J. B. Cooper.

39. **NORTH CONWAY,** Carroll Co. (2,331.) Built in '83 by North Conway Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Artists Brook, Kearsarge Brook and Mountain Brook, by gravity. RESERVOIR.—Cap., 2,000,000 galls.; impounding, 172 ft. above Main St. Supply main is 6,200 ft. long, 8 and then 6 ins. in diam. FISCAL YEAR CLOSED Jan 1. DISTRIBUTION.—Mains, 11 miles; Taps, 200; Services, iron; paid for by owners. Meters, 0. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 35. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost (in '90), $20,000. Cap. Stock, authorized, $50,000; all paid-up.

City, fire protection, free. MANAGEMENT.—Prest., G. W. M. Pitman; Secy. and Treas., Winthrop M. Pitman; Supt., Alfred Eastman. Rept. by Secy., Sept. 1.

48. **NORTHFIELD,** Merrimack Co. (1,115.) Supply from Tilton.

D 6. **NORTH WALPOLE,** (P. O. Bellow's Falls, Vt.), Cheshire Co. (Not given.) Domestic system owned by No. Walpole Aqueduct Co. Original works built a number of years ago. Supply, springs, lifted by Douglas pumps. Gasoline oil is used; av. cost, 10½c. per gall. Reservoir, Cap., 8,000 galls. Taps, 212; made by Co. for $7. Services, lead. Meters, 0. Company can compel use of meters, and any consumer may have one. Consumption, (Galls.) av., 25,000. Pressure, 10 lbs. Cap. Stock, authorized, $16,000; paid-up, $4,810. Floating debt, $10,170, at 6%. Expenses, $761: Operating, $150; int., $611. Revenue, City, fire protection, $75. MANAGEMENT.—Prest., Chas. J. O'Neal, Bellows Falls, Vt. Secy. and Treas., John Hassett; Supt. and Ch. Pump. Engr., Wm. H. Kiniry, Bellows Falls, Vt. Rept. by Supt., Sept. 16.

P 2. **NORTH WOODSTOCK,** Grafton Co. (Pop. Not given.) Projected by village or town; legislative authority to be secured in '97. Supply to be from stream by gravity. Probable cost, $10,000 to $15,000. Rept. by W. L. E. Hunt, Town Clk., July 17.

47. **PEMBROKE,** Merrimack Co. (3,172.) Supply from Suncook.

7, 12. **PENACOOK,** Merrimack Co. (Est. 1,800.) See both Boscawen and Concord.

40. **PETERBORO,** Hillsborough Co. (2,507.) Built in '96 by town. Engr., F. A. Gay, Manchester, N. H. Contr., C. H. Eglee Co., Boston. Formerly had works for fire protection only. SUPPLY.—Town Line Brook, by gravity. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 72; made by town. Services, cement lined i.; paid for by town to street line. Meters,0. Hydrants, public, 67; private, 4. PRESSURE.—55 to 120 lbs. FINANCIAL.—Bonded debt, $50,000 at 3%; MANAGEMENT.—Water Board. Rept. by F. A. Gay, Manchester, N. H.

41. **PITTSFIELD,** Merrimack Co. (2,605.) Built in '84 by Pittsfield Aqueduct Co. FRANCHISE.—Co. was exempt from local taxes for 10 yrs. under contract which expired Jan. 1, '95 and which has not been renewed as yet, except for hydrants. City to pay $33 per hydrant, per annum. SUPPLY.—Berry Pond, by gravity to and from reservoir. Pond is 2½ miles from, and 400 ft. above main street of village. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 7¼ miles. Taps, 365. Meters, 6; owned and controlled by Co. Use of meters compulsory for business blocks, hotels, etc. Hydrants, public 32; private, 1. PRESSURE.—75 lbs. FINANCIAL.—Cost, $40,000. Cap. Stock authorized, $40,000. Floating debt, $400 at 6%. Expenses: Operating, $1,300; int., $24; taxes, $645. Revenue, City, fire protection, $1,056. MANAGEMENT.—Prest., Reuben L. French; Clk., N. S. Drake; Treas., John A Goss; Supt., Chas. H. Lane. Rept. by Supt., Sept. 30. SEWERS.—Has combined sanitary and storm sewers.

42. **PLYMOUTH,** Grafton Co. (1,852.) Built in '81 by Plymouth Aqueduct and Water Co. Press rept. in '95 stated fire district was talking of buying works. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Springs, by gravity. RESERVOIRS. Cap., 4,000,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 160. Hydrants, 27. PRESSURE.—Ordinary, 76 lbs. FINANCIAL.—Cost, $40,000. Cap. Stock authorized, $20,000; all paid-up; paid 4% div'd. in '90. Bonded debt, $20,000, at 5%; due 1910. MANAGEMENT.—Address Co. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, Mar. 11, '82.

43. **PORTSMOUTH,** Rockingham Co. (9,827.) Now owned by city. Built in 1798 by Portsmouth Aqueduct Co. City took possession of the works Jan. 1, '91, paying the old Co. $150,000 for the same and in '92 enlarged and reconstructed the works. SUPPLY.—60 driven wells, by gravity, pumping to reservoir for high service. PUMPS.—Cap., 3,000,000 galls. Deane: one comp. cond., 2,000,000; one auxiliary, 1,000,000. RESERVOIRS.—Cap., not given. STAND-PIPE.—Cap., 528,800 galls.; 30x100 ft., on elevation of 50 ft. above river. DISTRIBUTION.—Mains, (In '92), 21½ miles. Hydrants, public, 150. PRESSURE. — Ordinary, 60 lbs.; fire, not given. FINANCIAL. — Cost, $425,000. MANAGEMENT.—Comrs., F. J. Philbrick, A. C. Heffenger and John S. Rand; Secy. and Supt., John O. Ayers. Rept. by Supt., Oct. 31.

44. **RAYMOND,** Rockingham Co. (1,131.) Built in '93 by town. Engrs., Farrington & Scruton, Portsmouth. Contrs., Moore & Co., Boston. SUPPLY.—Driven wells, by pumping. PUMPS.—Cap., 750,000 galls. Knowles. STAND-PIPE—Cap., 118,000 galls.; 15x90 ft. FISCAL YEAR CLOSED Feb. 15. DISTRIBUTION.—Mains, 2 miles; cost extensions met by bonds. Taps, 80; made by town for $1. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 23; private, 2. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—65-75 lbs. Rept. by J. T. Burthel, Water Comr., July 9.

45. **ROCHESTER,** Strafford Co. (7,396.) Now owned by city. Built in '85 by Rochester Aqueduct & Water Co.; bought by city in '91 for $118,000. SUPPLY.—Pond, by gravity, through canal to reservoir, thence to town, a total distance of four miles. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 10 (?) miles; cost extensions

met by earnings. Taps, 1,048; made by city for $3. Services, galv. i.; paid for by owner of property. Meters, 1. Hydrants, public, 150; private, 6. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost $100,000 (in '90). Bonded debt, $200,000 at 4%; due 1922. Sinking Fund: $14,000, invested in city note at 4%. Expenses, $2,300: Operating, $1,500; int., $8,000. Revenue, $14,489; City, fire protection, $3,675; other purposes, $10,814. Rept. by Chas. W. Brown, Sept. 26. PROJECTED IMPROVEMENTS.—New source of supply, reservoir, etc. SEWERS.—Has sanitary and storm sewers.

46. **SOMERSWORTH,** (Formerly Great Falls.) Strafford Co. (6,207.) Now owned by city. Built in '64 by Great Falls Mfg. Co. In '89 Great Falls Water Co. was organized, management being same as before. City was incorporated Feb., '93, as City of Somersworth and bought the plant in '96, and began to enlarge it; appraisers fixed price to be paid Co. at $22,055. SUPPLY.— Salmon Falls River, pumping to reservoir and stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2 Blake, 1,500,000 and 1,000,000 galls. respectively. STAND-PIPE.—Cap., 895,000 galls.; 40 × 95 ft. DISTRIBUTION.—Mains, 10 miles. Hydrants, public, 80. PRESSURE.—95 lbs. FINANCIAL.—Cost, $160,000. (Est., as works are incomplete.) MANAGEMENT.—Comrs., Mayor, Chris. H. Wells. Rept. by Mayor. PROJECTED IMPROVEMENTS.—Press rept., Sept. 24, '96, stated contract for filter beds had been awarded to Ames & O'Shea, Somersworth, for $22,037.

51. **SOUTH WOLFBOROUGH,** Carroll Co. Supply from Wolfborough.

47. **SUNCOOK,** Merrimack Co. (Est. 5,000.) Present works under construction in '96 by Suncook Water Works Co. Supplies water in towns of Pembroke and Allenstown. Press rept. in '93 mentioned foreclosure of mortgage on private plant; date built not given. Engr., Leon E. Scruton, Portsmouth. FRANCHISE.—10 yrs. from 1896. Co. is not exempt from local taxes. City to pay $25 per hydrant per annum. SUPPLY.—Bear Hill Pond, by gravity, (press rept.) FILTERS.—Cap., 72,000 galls.; gravel and sand. RESERVOIRS.—Cap., 2,000,000 galls.; storage. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by Co. Taps, 200; made by Co. free. Services, iron; paid for by Co. to property line. Meters, 0. Co. can compel the use of meters and anyconsumer may have one. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—85 to 88 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock, authorized, $60,000; all paid-up. Expenses: Operating, "very light." Taxes, $100. Revenue: Consumers, unmetered, $200; City, fire protection, $1,375. MANAGEMENT.—Prest., Frank Jones, Portsmouth, owner. Rept. by Supt., Levi L. Aldrich, Aug. 19. SEWERS.—Has sanitary and storm sewers.

48. **TILTON AND NORTHFIELD,** Belknap and Merrimac Cos. (Tilton, 1,521; Northfield, 1,115.) Built in '88 by Tilton & Northfield Aqueduct Co. SUPPLY.—Knowles Lake, 300 ft. above village, by gravity. RESERVOIRS.—Cap., 3,000,000 galls.; distributing. DISTRIBUTION.—Mains (in '90), 6 miles. Taps (in '90), 180. Meters, 0. Hydrants, public, 26. PRESSURE.—100 lbs. FINANCIAL.—Cap. Stock, paid up, $47,100. Bonded debt, $9,000, at 6.% MANAGEMENT.—Prest., Alpha J. Pillsbury; Treas., Wm. H. Moses, Tilton. Rept. by Treas., Aug. 13.

49. **WARNER,** Merrimack Co. (1,383.) Under construction in '96 by Silver Lake Reservoir Co. Contrs., Gustine & Son, Keene, N. H. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Franchise granted without compensation. SUPPLY.—Silver Lake, springs and drainage area, by gravity. FILTERS.—Gravity. RESERVOIRS.—Cap., 25,000,000 galls. Storage. DISTRIBUTION.— Mains, 3 miles. Hydrants, public, 16; private, 5. CONSUMPTION.—(Galls.) av., 75,000; min., 45,000. PRESSURE.—65 to 80 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock, $7,000: Common, authorized, $10,000; paid-up, $1,500; Bonded debt, $6,000, at 4%. MANAGEMENT.—Prest., A. T. Batchelder; Secy. and Supt., A. P Davis; Treas, W. H. Elliott. Rept. by Secy., June 13.

D 7. **WEST CANAAN,** Grafton Co. (Not given.) Built in '86 by West Canaan Aqueduct Co. for domestic use. Supply, spring, by gravity. About ¾ miles of mains and five families supplied in '90.

50. **WHITEFIELD,** Coos Co. (Pop., 2,041.) Built in '92. Apparently quite an extensive system, but no rept. could be obtained.

51. **WOLFBOROUGH,** Carroll Co. (3,020.) Built in '89 by town; has supplied South Wolfborough since '90. Wolfborough Aqueduct & Water Co. was incorp. in '87 and had made surveys and was preparing to build works in '89, when town bought franchise, rights, etc., at actual expenditure by Co., about $500. SUPPLY.—Beach pond, by gravity. Pond has area of 300 acres, is 4 miles from town, and 474 ft. above Ry. at South Main St. Supply main, 6-in. w. i. RESERVOIR.—Cap., 250,000 galls.; about 1¼ miles from town hall; 50 ft. diam. at bottom, 80 ft. at high water line, av. depth, 10½ ft. DISTRIBUTION.—Mains, 12 miles. Taps, 56. Hydrants, 51. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $54,855. Bonded debt, $57,000; int., $1,671. Revenue, $1,643. MANAGEMENT.—(Sept., '96) Comr., Jos. P. Heath, Wolfborough Falls. NOTE.—No report since '90-'91 Manual.

52. **WOODSVILLE,** Grafton Co. (Est., 1,000.) Built in '86 by Woodville Aqueduct Co. SUPPLY.—Ammanoosuc River, pumping direct. PUMPS.—Cap., 1,500,000 galls.,

Lang. DISTRIBUTION.—Mains, (in '90.) 4 miles. Taps, 217. Hydrants, (in '91.) 20. PRESSURE.—(in '91.) Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $32,527. Cap. Stock, paid 4% div'd in '91. Bonded debt, (in '91.) $10,000 at 5%. Revenue, Consumers, $3,711; int., (in 91.) $1,187. MANAGEMENT.—Pres., E. B. Mann; Clk. and Treas., C. C. Rinehart; Supt., G. E. Cummings.

VERMONT.

D 1. **ALBANY,** Orleans Co. (995.) Built in '92 by Albany Water Supply Co., for domestic service. Engr., J. C. Campbell. No legal difficulties. Supply, springs, by gravity. Reservoir, Cap., 10,000 galls. FISCAL YEAR CLOSED Sept. 1. Mains, 1 mile. Taps, 50; made by company. Services, iron; paid for by Co. Meters, 0. CONSUMPTION.—(Galls.) av., 1,000. Pressure, 50 lbs. Cost, $2,000. Sinking Fund: $300, invested at 6%. Expenses, $45: Operating, $20; int., $18; taxes, $7. Revenue, $225, from unmetered water. Rept. by Mgr., J. C. Campbell.

D 2. **ARLINGTON,** Bennington Co. (1,352.) Built in '94 by Co.; put in operation Nov. 1. No legal difficulties. Supply, spring, by gravity, 200-ft. head. Mains, 3 miles. Taps, 90; made by Co. at cost. Services, w. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Pressure, 90 lbs. Cost, $4,000. Cap. Stock, paid-up $4,000. Expenses: Operating, $100. MANAGEMENT.—Prest., Jessie Burdett; Secy., and Treas., O. M. Barber; Supt., G. M. Browson. Rept. by Supt., Nov. 9.

D 3. **BAKERSFIELD,** Franklin Co. (1,162.) Built in '40, for domestic supply. ½ mile of 1-in. lead pipe supplies about 40 families, who jointly own system. Cost, $2,000. Supt., R. H. Barlow.

1. **BARRE,** Washington Co. (4,146.) Built in '88 by Barre Water Co. FRANCHISE.—Provides for purchase of works by town at intervals of 5 yrs. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Stevens branch of Winooski River, by gravity. In '96 a 400,000 Deane dup. water power pump was sold for use at Barre, whether for use in connection with this or a rival plant is not stated. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 14 miles. Taps, 731. Meters, 10. Hydrants, public, 74. FINANCIAL.—Cost, $75,000. Cap. Stock, $50,000. Bonded debt, $25,000 at 4%; due 1909. Revenue, city, fire protection, $2,200. MANAGEMENT.—Prest., J. Henry Jackson; Secy., Edw. W. Bisbee; Gen. Mgr., C. S. Goodhue, Springfield, Mass.; Treas., W P. Birnie, Springfield, Mass.; Supt., W. D. Pheips. NOTE.—Press rept. in '94 stated that "150 faucets" were supplied by Pure Spring Water Co., whose works were partially developed in about '89, although Co. was not incorp. until about '92. Supply, springs, from three small covered reservoirs with combined cap. of about 40,000 galls. Aug., '96, press rept. stated that Cold Spring Water Co. of South Barre had built reservoir, laid 4-in. pipe to city and put in about "150 faucets."

2. **BARTON,** Orleans Co. (778.) Built in '89 by village. SUPPLY.—Mountain brook, by gravity; filtered at entrance of main, through 18-in. of charcoal. Source about 300 ft. above and 6,000 ft. from village. RESERVOIRS.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by rentals. Taps, 150; made by village, free. Services, paid for by village to cellar. Meters, 0. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—110-150 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $15,000, at 4½%. MANAGEMENT.—Three Comrs. Treas., H. C. Pierce. Rept. by E. F. Dutton, Comr., July 13.

3. **BARTON LANDING,** Orleans Co. (482.) Sold to village in June, '98. Built in '84 by Co. SUPPLY.—Springs, by gravity, from reservoir. RESERVOIR.—Cap., 30,000 galls.; 23 ft. in diam., 10½ ft. deep. New reservoir said to have been built in '95. DISTRIBUTION.—(In '90.) Mains, 2. Taps, 80. Hydrants, public, 2 in '90. PRESSURE. Ordinary, 40 lbs. FINANCIAL.—Cost, $3,100. MANAGEMENT.—Water Comrs., J. H. Brown, A. D. Mathews and David Gillis.

28. **BATESVILLE,** Orleans Co. Supplied from Newport.

4. **BELLOWS FALLS,** Windham Co. (3,092.) Now owned by village. Built in '48 by Bellows Falls Aqueduct Co., purchased by village in '73. SUPPLY.—Lake Minard (and Farr Brook?) by gravity. Lake formerly reported as having area of 75 acres, drainage area of ½ sq. mile, est. av. depth of 12 to 15 ft., and elev. 300 ft. above village. Rept. of Engr. E. A. Ellsworth, Boston, in '92, as published in newspaper, gave area of lake as 27 acres and its drainage area, including lake surface, 119 acres; also gave drainage area of Farr Brook as 163 acres. Press rept. later in '92 stated that brook had been connected with lake by pipe at cost of $4,500. Original supply main, 4-in.; replaced by 4-in., and later by 8-in., 9,440 ft. long. Press repts. in '95 state that a new 20-in., or 20 and 16-in. main was completed in July of that year at cost of about $12,500. FISCAL YEAR CLOSED Apr. 6. DISTRIBUTION.—Mains, 8 miles. Taps, 1,600. Meters, 70. Hydrants, public, 55. FINANCIAL.—Cost, $75,000. Debt, $38,000. MANAGEMENT.—Three comrs. Treas., C. E. Capron; Supt., C. S. Moore. REFERENCE.—Eng. News, May 20, '82.

5. **BENNINGTON,** Bennington Co. (3,971.) Built in '85-7 by Bennington Water Co. Co. is not exempt from local taxes. SUPPLY.—Mountain springs, by gravity. RESER-

VOIRS.—Cap., 76,000,000 galls.; distributing, 1,000,000; storage, 75,000,000. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 20 miles. Services, lead. Hydrants, public, 37. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—(In '88.) Cost, $60,000. Cap. Stock, $60,000. Bonded debt, $48,000 at 5%. MANAGEMENT.—Prest., Henry W. Putnam; Secy., John T. Shurtleff; Treas., Elbert H. Putnam. Rept. by Co., Aug. 19. SEWERS.—Has sanitary sewers.

F1. **BETHEL,** Windsor Co. (1,448.) Built in '86 by fire district for fire protection. Pumps, one Dean underwriter steam, one Holly water power. Mains, ¾ miles. Hydrants, 10. Pressure, 100 lbs. Ch. Pump Engr., J. B. Reagan. Rept. by Supt., C. D. Cushing, Sept. 8. SEWERS.—Has storm sewers only.

6. **BRADFORD,** Orange Co. (610.) Built in '92 by village. Engr., S. M. Gray, Providence, R. I.; built by day's labor. SUPPLY.—Springs and streams, by gravity. RESERVOIRS.—Cap., 1,100,000 galls. Distributing. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5 miles; Taps, 125; made by city. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 33. FINANCIAL.—Cost, $46,000. Bonded debt, $40,000. Expenses, $1,768: Operating, $48; int., $1,720. Revenue, $1,914: Consumers, $1,054; City, fire protection, $825; other purposes, $60. MANAGEMENT.—Prest., R. Farnham; Secy., H. A. Winship; Treas., Barron Hay; Supt., N. W. Barrett. Rept. by Secy., June 13. SEWERS.—None.

7. **BRANDON,** Rutland Co. (3,310.) Built in '79 by fire district. No legal difficulties. SUPPLY.—Fern Lake, in town of Leicester, by gravity. FISCAL YEAR CLOSED Dec. 15. DISTRIBUTION.—Mains, 12 miles; cost extensions met by bonds. Taps, 350; made by district, free. Services, galv. i.; paid for by district. Meters, 0. Hydrants, public, 42. PRESSURE.—Ordinary, 40 lbs.; fire, 60 lbs. FINANCIAL.—Present Cost, $54,000. Bonded debt, $39,000, at 4%; due $1,000 annually. Revenue, $3,000. MANAGEMENT.—Prudential committee. Treas., E. D. Thayer; Supt., C. W. Briggs. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 10, '93.

8. **BRATTLEBORO,** Windham Co. (5,467.) Principal system built in '84 by Geo. T. Crowell (under name Chestnut Hill Reservoir Co. ?). Rept. by special village com. in '93 stated that of about 1,100 families only some 200 were taking water from above system balance being supplied by 10 or 12 aqueduct associations (consumers and shareholders generally the same). SUPPLY.—Springs, by gravity and pumping. PUMPS.—Cap., 300,000 galls. Deane dup. RESERVOIRS.—Cap., 8,000,000 galls.; distributing. DISTRIBUTION.—Mains (in '92), 13 miles. Services, lead; paid for by consumer. Owner of works cannot compel the use of meters. Hydrants, public, 32; private, 3. PRESSURE.—Ordinary, 85 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, authorized, $250,000. Bonded debt, $100,000. MANAGEMENT.—Prest., Geo. E. Crowell; Secy. and Treas., C. B. Crowell; Supt., S. H. McLean. Rept. by Prest., June 26.

9. **BRISTOL,** Addison Co. (1,828.) Built in '87-90 by N. H. Munsill, Malone, N. Y. In '94 works were connected with fire pumps of Bristol Mfg. Co., for fire purposes (press rept). SUPPLY.—Domestic, springs, by gravity to reservoir. DISTRIBUTION.—Mains (in '90), 4 miles. Taps, 100. Hydrants, public, 16. FINANCIAL.—Cost, $5,000. Revenue, $500.

10. **BURLINGTON,** Chittenden Co. (14,590.) Built in '67 by city. SUPPLY.—Lake Champlain, pumping to reservoir, and to tank for high service. New intake, 2½ miles 24-in. cast-iron pipe, with Falcon Joints, laid in '94. See Eng. News, June 21, '94, for illustrated description. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 comp. cond. Worthington. High service supply, lifted by hydraulic pump operated by pressure in low service main. See Eng. News, Oct. 1, '87. Anthracite coal used; av. cost, $4.85 per short ton; mill shavings, $38.50 per week for eight weeks. RESERVOIRS.—Cap., 7,000,000 gallons; two, side by side. TANK.—Cap., 170,000 galls.; iron. FISCAL YEAR CLOSED Jan 1. DISTRIBUTION.—Mains, 36 miles; cost extensions met by appropriations. Taps, 2,969; made by city, free, including services to curb. Services, galv. i.; paid for by consumer from curb. Meters, 1,261; owned by city, mostly; controlled and repaired by city. Use of meters: City can compel the use of meters and any consumer may have one. Hydrants, public, 168; private, 27. CONSUMPTION.—(Galls.) av., 888,083; max., 1,000,000; min., 750,000; 27% through domestic and 10% through manufacturers' meters. PRESSURE.—Ordinary, 75 to 85 lbs., at center of city. Steam fire engines are used in a portion of the city. FINANCIAL.—Cost, $454,949. Bonded debt, $248,000 at 4%. Sinking Fund, $144,236. Expenses, $38,748: Operating, $27,373; int., $11,375. Revenue, $47,719: Consumers, $39,593; misc., $3,162; City, fire protection, $3,070; street sprinkling, $1,569; public buildings, $135; watering troughs, $250. MANAGEMENT.—Water Comrs. Rept. by Supt., F. H. Crandall. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. New, Dec 23, '82; July 28, '92; Oct. 1, '87 (high service motor); June 21, '94 (intake).

D 4. **CANAAN,** Essex Co. (616.) Built in '94 by C. T. Stoddard, West Stewartstown, N. H. Works exempt from local taxes. Supply, Springs, by gravity to and from 10,000 gall. reservoir. Springs are in Canada; 3-in. pipe leads from them to reservoir. Mains, 2 to 3 miles. Taps, 50 to 100. Meters, owned, controlled and repaired by proprietor of works. Use of meters optional with proprietor. Consumption, (Galls.) av.,

10,000. Pressure, 30 lbs. Cost, $6,000. Cap. Stock, authorized, $10,000; all paid-up. Bonded debt, $2,000, due in 20 yrs. Expenses, Operating, $50 per yr.

P 1. **CASTLETON,** Rutland Co. (2,896, town.) Bill authorizing fire district No. 1 to build works and issue $15,000 bonds introduced in legislature late in '96.

D 5. **DERBY,** Orleans Co. (2,900.) Built in '95 by Dates & Grout. Rates not subject to regulation by city. Co. not exempt from local taxes. No legal difficulties. Supply, springs, by gravity to and from reservoir. Mains, 2 miles. Services, iron; paid for by consumer. Meters, 0. Rept. by W. S. Robbins, Town Clerk.

11. **DERBY LINE,** Orleans Co. (Not given). Built in '92 by H. S. Haskell under name of International Water-Works. FRANCHISE.—20 yrs. from '92. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $700 per annum for public service. No legal difficulties. SUPPLY.—Springs, by gravity from storage reservoir. RESERVOIRS.—Cap., 500,000 galls. 2—250,000. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by town. Taps, 400; made by proprietor, free. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 58; private, 1. PRESSURE.—Ordinary, 110 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $36,000. Rept. by Owner, Nov. 1. SEWERS.—Has storm sewers only.

EAST BARRE, Washington Co. (Not given.) Press rept., Sept., '98, stated that East Barre Water Co. was organized in '92 and completed "aqueduct" from "one of the feeders of East Barre branch" and were about to turn on water when Co. was temporarily enjoined at instance of Barre Water Co. from using stream, latter Co. claiming prior rights. Later rept. states injunction was dismissed.

12. **ENOSBURGH FALLS,** Franklin Co. (2,299, town.) Built in '94 by village. Engr., W. H. Lang, Burlington. Contrs., Lang & Goodhue Mfg. Co., Burlington. SUPPLY.—Missisquo River, pumping direct by water power. PUMPS.—5-cylinder pump, Lang. FISCAL YEAR CLOSED Apr. 25. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by general taxation. Taps, 150; made by village. Services, galv. i.; paid for by village to curb line. Meters, 0. Hydrants, public, 29. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—Bonded debt, $15,000 at 4%; due 5 to 20 yrs. Expenses, $1,004: Operating, $405; int., $600. Revenue, $1,359; Consumers, $1,069; City, fire protection, $290. Deficits are met by taxation to full extent. MANAGEMENT.—Chn., V. A. Irish; Secy., A. A. Aseltine; Treas., L. L. Marsh; Ch. Pump. Engr., T. H. Armstrong. Rept. by A. A. Aseltine, June 13. SEWERS.—Has sanitary and storm sewers.

13. **FAIR HAVEN,** Rutland Co. (2,791.) Built in '80 by village. SUPPLY.—Inman Pond, by gravity (?). Pond has area of 80 acres, small drainage area; 3.4 miles from, 200 ft. above village. Press rept. late in '95 stated that water comrs. "are to use electricity in operating pumps at Inman Pond." FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains (in '90), 4.3 miles. Taps made by village. Services, iron; paid for by property-owner. Meters: 200; owned, controlled and repaired by village. Village can compel the use of meters and consumers may have one. All services are being metered as rapidly as possible. Hydrants, public, 30. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—(In '90.) Cost, $36,000. Bonded debt, $35,000 at 4%. Sinking Fund: $5,700, invested at 4%. MANAGEMENT.—Prest., Secy. and Treas., F. E. Allen; Supt., O. A. Bryant. Rept. by Supt., July 14. REFERENCE.—Eng. News, June 10, '82.

D 6 (?) **FRANKLIN,** Franklin Co. (1,300.) Built in '91 by James Randall. Supply, large spring, by gravity. Rept. by W. C. Robie, Aug. 17. No sewers.

D 7. **GREENSBORO,** Orleans Co. (918.) Works for domestic supply built in '93 by D. C. Melvin. SUPPLY.—Caspian Lake, by gravity. Taps, 10. D. C. Melvin, proprietor.

14. **HARDWICK,** Caledonia Co. (1,547.) Present plant built by town in or since '91. In '91 village bought domestic plant of Hardwick Aqueduct Co., and on June 19 of same year voted to build complete works, which have evidently been completed since, although no definite information can be secured.

15. **HYDE PARK,** Lamoille Co. (1,633.) Present works built in '80 by Hyde Park Water Co. and now owned by Carroll S. Page. Works were originally built about 75 years ago and incorporated as Hyde Park Water Co about '60. SUPPLY.—Two springs, 100 ft. above village, by gravity; one spring below village, pumping to reservoir. PUMP.—Knowles; driven by wind mill and electric power. Current supplied by village electric company. RESERVOIR.—Cap., 40,000 to 50,000 galls., 60 ft. above village; storage. DISTRIBUTION.—Mains, 2 to 3 miles. Taps, 50. Meters, 2. Use of meters compulsory for hotel. Hydrants, public, 8. FINANCIAL.—Cost, $6,000. Expenses: Operating, $100. MANAGEMENT.—Prest., Carroll S. Page; Secy. and Treas., T. H. Page; Supt., J. S. Leach. Rept. by Prest., June 8. REFERENCE.—Eng. News, Dec. 16, '82.

16. **ISLAND POND,** Essex Co. (Est. 1,200.) Built in '79 by Island Pond Aqueduct Co. SUPPLY.—Springs by gravity. DISTRIBUTION. — Mains, 3 miles. Taps, 100. Meters, 0. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 30,000. FINANCIAL.—Cost, $12,000. No debt. MANAGEMENT.—Owner, Geo. W. Noyes. NOTE.—No report since '90-1 Manual. Press repts. in '95-6 indicate that village works have been projected, but up to late in '96 nothing definite appears to have been done to that end.

17. **JOHNSON,** Lamoille Co. (1,462.) Built in '95 by village; put in operation Nov. 1. Engr., C. L. Woodbury, Burlington. SUPPLY.—Brook, by gravity. RESERVOIR.—Cap., 150,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by taxation. Taps, 50. Services, galv. iron; paid for by consumer. Meters, 0. Hydrants, public, 16; private, 2. PRESSURE.—70 lbs. FINANCIAL. Cost, $10,800. Bonded debt, $6,000 at 4%; $4,800 at 6%. Revenue, $450, from unmetered water. MANAGEMENT.—Prest., C. H. Stearns; Secy. and Treas., B. L. Austin; Supt., E. L. Balch. Rept. by Prest., Sept. 11. PROJECTED IMPROVEMENTS.—Cover for reservoir.

18. **LUDLOW,** Windsor Co. (1,081.) Built in '94 by village. Engr., Joel Foster, Montpelier. Contrs., Conn. Pipe Mfg. Co., New Haven. SUPPLY.—Mountain spring, by gravity. RESERVOIRS.—Cap., 350,000 galls; storage. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 6 miles. Taps, 151. Services, iron; paid for by village to curb line. Meters, 2, owned, controlled and repaired by village. Use of meters optional with consumer. Hydrants, public, 33. PRESSURE.—120 lbs. FINANCIAL.—Cost, $24,507. Bonded debt, $25,000 at 4%, due $10,000 in 1910, and $15,000 in 1915, but optional after 1900 and 1905, respectively. Expenses, int., $833. Revenue, $2,117: Consumers, $1,417; City, fire protection, $700. MANAGEMENT.—Water Comrs. Rept. by Supt., E. A. Howe, June 27. SEWERS.—Has sanitary sewers.

19. **LYNDON CENTER,** Caledonia Co. See Lyndonville.

19. **LYNDONVILLE AND LYNDON CENTER,** Caledonia Co. (606.) Built in '95 by Lyndonville village; put in operation Oct. 1. Engr., John W. Burke, New York City. Contrs., Flood & Sherrill, Sandy Hill, N. Y. SUPPLY.—Hinds Brook, by gravity from reservoir. RESERVOIR.—Cap., 1,430,000 galls. Formed by masonry dam across brook, 80 ft. long, 18 ft. high. Surface of water about 340 ft. above "level portion of village." Supply main, 10-in. c. i., about four miles long. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by rentals. Taps, 155; made by village. Meters, 0. Hydrants, public, 45; 6 of these are in Lyndon Center. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—145 lbs. FINANCIAL.—Cost, $39,889. Bonded debt, $40,000 at 4%; due May, 1925, or after May, 1910, at the option of village. Expenses, $2,000: Operating, $200; int., $1,600. Taxes, $200. Revenue, $2,900: Consumers, $2,250; City, fire protection, $650. MANAGEMENT.—Chn. and Supt., O. G. Chase; Secy., A. D. Paige; Treas., J. W. Sanborn. Rept. by Secy., Aug. 17. SEWERS.—Has sanitary and storm sewers.

20, 21. **MANCHESTER AND MANCHESTER CENTER,** Bennington Co. (1,907, town.) Built in '94 by Manchester Water Co. Two separate systems owned by the same Co. Engr. and Contr., John Marsden, Utica, N. Y. Press rept. states that fire district voted in '94 to sell springs recently bought by it, to a Co. FRANCHISE.—Renewed each year. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.—Cap., 2,000,000 galls.; one of equal capacity for each village; press rept. gives elev. of reservoir as 225 ft. above Center. DISTRIBUTION.—Mains, 10 miles. Taps, 180. Services, galv. i.; paid for by consumer. Meters, 24; owned and controlled by Co. Use of meters compulsory for all large users. Co. can compel use of meter and any consumer may have one. Hydrants, public, 39; private, 2. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—125 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock authorized, $40,000; all paid-up. Bonded debt, $20,000 at 5%, due in 1925. Expenses, $1,660: Operating, $500; int., $1,000; taxes, $160. Revenue, $2,900: Consumers, $2,100; City, fire protection, $800. MANAGEMENT.—Prest., Henry W. Millar, Utica, N. Y.; Secy., J. W. Fowler, Manchester; Treas., J. P. Black, Manchester; Supt., John Marsden. Rept. by Prest., July 21.

21. **MANCHESTER CENTER,** Bennington Co. (Not given.) Built in '94 by Manchester Water Co. This system is entirely distinct from that at Manchester, but Co. included all information in Manchester rept., which see.

22. **MIDDLEBURY,** Addison Co. (1,762.) Built in '91 by village; put in operation Jan. 1, '92. SUPPLY.—Otter Creek, pumping direct; filtered through gravel. PUMP.—Lang's Improved Flanders water power. FILTER.—Cap. (forced), 200,000 galls. Gravel. FISCAL YEAR CLOSED Jan. 15. DISTRIBUTION.—Mains, 7.5 miles; cost extensions met by appropriations. Taps, 200; made by village, free to curb. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters: village can compel use of meters and any consumer may have one. Hydrants, public, 49. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 70 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $40,000. Floating debt, $7,987 at 5%; Bonded, $30,000 at 4%. Expenses: Operating, $600; int., $12. MANAGEMENT.—Secy., Geo. Hammond; Treas., C. E. Penney; Supt., B. B. Hope; Ch. Pump. Engr., A. H. Langworthy. Rept. by O. A. Piper, Sept. 1. SEWERS.—Has sanitary sewers.

23. **MONTGOMERY CENTER,** Franklin Co. (1,734, town.) Built in '95 by H. O. Rowley and Chas. T. Hall; put in operation Aug. 1. Naron & Bisby, Troy, Engrs. and Contrs. SUPPLY.—Hannah Clark Brook, by gravity from impounding reservoir about 175 ft. above village. Taps, 75; made by owners of works, including service to curb, free. Meters, 0. Hydrants, public, 7. PRESSURE.—Ordinary, 72 lbs. Rept. by Rowley & Hall, Sept. 7.

24, D 8. **MONTPELIER,** Washington Co. (3,617.)

MUNICIPAL WORKS.

Built in '84 by village. SUPPLY.—Berlin Pond, area, 1 sq. mile, by gravity; filtered. Dam one mile below pond, 364 ft. above village. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 18.6 miles. Taps, 731. Hydrants, public, 65. FINANCIAL.—Expenses: Operating, $3,220. Revenue, $11,925: Consumers, $9,620; City, fire protection, $2,305. MANAGEMENT.—Supt., Joel Foster, C. E.

THE HUBBARD WORKS.

Built in '20 by Roger Hubbard for domestic supply; next owned by Erastus, and then Jno. E. Hubbard, son and grandson, respectively, of builder. Town neither controls rates nor has right to purchase works. Supply, springs, by gravity to small reservoir. Fiscal year closed Nov. 1. Distribution.—Mains, 8½ miles. Taps, 180. Services, lead. No meters or hydrants. Pressure, 82 lbs. Rept., June 30. For interesting description of early works see Eng. News, May 22, '86.

25. **MORRISVILLE,** Lamoille Co. (Est., 1,500.) Purchased by village in '95 for (press rept.) $7,000. Built in '85 by Morrisville Aqueduct Co., and afterwards owned by W. W. Warren. SUPPLY.—Springs, by gravity. RESERVOIRS.—Three; one 375,000; failed about time of completion in '95. Press rept. states reservoir was to be covered. DISTRIBUTION.—(In '95) Mains, 8 miles. Taps, 300. Meters, 8. Hydrants, public, 10.

26. **NEWPORT,** Orleans Co. (1,730.) Built in '85 by village. Improved and enlarged in '95. Engr., J. W. Burke, New York City. Contrs., Seymour & Banker, Gloversville, N. Y. Works were for some time operated by Prouty & Miller, supply then being pumped from Lake Memphremagog. Press rept., Jan., '96, stated that Batesville and West Derby had just been "piped." SUPPLY.—Derby Pond, by gravity. RESERVOIR.—Cap., 1,000,000 galls.; 1¼ miles from village and about 225 ft. above lake, but too little elev. to supply highest hill sections. DISTRIBUTION.—Mains, 11 miles; cost extensions met by revenue. Taps, 400; made by village to cellar wall. Services, galv. i. Meters, 0. Hydrants, public, 52. PRESSURE.—125 lbs. FINANCIAL.—Cost, $50,000. Debt: Floating, $7,000; Bonded, $40,000 at 4%; due 25 yrs. Expenses, $2,600: Operating, $600; int., $2,000. Revenue, $3,900: Consumers, $3,500; City, fire protection, $400. MANAGEMENT.—Prest., E. Lane; Secy., C. A. Prouty; Treas., H. S. Root; Supt., E. B. True. Rept. by Supt., Aug. 8. SEWERS—Has sanitary and storm sewers

27. **NEWPORT CENTER,** Orleans Co. (Not given.) Put in operation Aug. 1, '95, by Newport Center Water Co., but not fully completed up to time of report. Engr. and Contr., C. L. Erwin. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 50,000 galls.; distributing. DISTRIBUTION.—Mains, not given; cost extensions met by Co. Taps, 56. Services, galv. i.; paid for by Co. FINANCIAL.—Cap. Stock, authorized, $15,000; paid-up, $5,000. MANAGEMENT.—Prest., D. L. Hildreth; Secy., Treas. and Supt., C. L. Erwin. SEWERS.—Partial sanitary system.

D 9. **NORTHFIELD,** Washington Co. (1,222.) Built in '54 by several Cos.; now owned by Northfield Aqueduct Co. Supply, springs, by gravity. Fiscal year closed July 1. Mains, 5 miles; cost extensions met by Co. Services, iron; paid for by Co. Meters, 0. Prest., Amos Plastridge. Rept. by Supt., J. F. Severance. G. R. Andrews reported in '96 to be constructing a new system to be supplied from springs.

28. **NORTH POWNAL,** Bennington Co. (Pownal town, 1,919.) Built in '93 by North Pownal Manufacturing Co. Engr., Prof. D. M. Greene, Troy, N. Y. No Contr. SUPPLY.—Springs, by gravity. Press rept. states that dam is built across stream formed by nearby springs, dam being 50 ft. long, 50 ft. high, and forming 500,000-gall. reservoir 4,000 ft. above Co.'s mill and 175 above village; also that 10-in. pipe leads to mill. DISTRIBUTION.—(Press rept.) Mains, 6 and 4-in., probably short length. Hydrants, 10. Families supplied (est. before completion), 50. FINANCIAL.—Cost, $10,000. MANAGEMENT.—Co. Supt., Jno. J. Marsh, North Adams, Mass. Rept. by G. H. Miner, Bookkeeper of Co., Dec. 29.

D 10. **NORWICH,** Windsor Co. (1,304.) Built in '93 by Norwich Water Supply Co.; put in operation Sept. 1. Contr., Sidney Davis. Supply, Springs, by gravity. Reservoirs, Cap., 21,000 galls.; 20 × 20 ft., 7 ft. of water. Fiscal year closed July 1. Mains, ½ mile. Taps, 20. Services, iron; paid for by consumer. Use of meters optional with consumer. Hydrants, private, 4. Cost, $3,000. Cap. Stock, authorized, $10,000; paid-up, $3,000. Prest., B. E. Lewin; Secy. and Treas., W. S. Baules; Supt., D. W. Stewart. Rept. by Supt., Nov. 9. NOTE.—Norwich Aqueduct Co. applied to legislature for charter late in '96.

29. **PITTSFORD,** Rutland Co. (1,775.) Built in '93 by Pittsford Aqueduct Co.; put in operation July 4. Engrs., Chappell & Burke, Rutland. Contrs., Flood & Sherrill, Sandy Hill, N. Y. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes, but receives no compensation for public service. No legal difficulties. SUPPLY.—Spring, by gravity. RESERVOIRS.—Cap., 20,000 galls. Distributing; covered. DISTRIBUTION.—Mains, 5 miles; cost extensions met by stock and receipts. Taps., 125; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—80 lbs. FINANCIAL.—Cost, $26,000. Cap. Stock, authorized, $30,000; paid-up, $22,000. Floating debt, $6,000 at 5%. Expenses, $450: Operating, $150; int., $300.

Revenue: Consumers, $900. MANAGEMENT.—Prest., J. M. Goodenough; Secy., S. K. Burbank; Treas., H. G. Peabody; Supt., F. B. Noyes. Rept. by Secy., Aug. 22. SEWERS.—Has sanitary sewers.

30. **POULTNEY,** Rutland Co. (3,031.) Built in '89 by village. SUPPLY.—Crystal Lake, by gravity. Lake in Hampton, N. Y; cap., 38,000,000 galls.; 16 miles from, 276 ft. above town. FISCAL YEAR CLOSED April 10. DISTRIBUTION.—Mains, 5 miles; cost extensions met by taxation. Taps, 150; made by village, free. Services, galv. i.; paid for by owner of property. Meters, 0. Use of meters optional with village. Hydrants, public, 40. PRESSURE.—125 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $30,000, at 4%, due in 25 yrs. Expenses: int., $1,200. Revenue, $1,200. Rentals pay interest and all other expenses. MANAGEMENT.—Prest. and Supt., R. G. M. Johnson; Treas, A. H. Varney. Rept. by Supt., June 5.

31. **PROCTOR,** Rutland Co. (1,758.) Under construction in '96 by village. Contr., Vermont Marble Co. Engr., F. C. Coffin, Boston. SUPPLY.—Springs and streams, by gravity, with pumps in reserve. PUMPS.—Cap., 360,000 galls., electric; electric power generated from water power at Marble Works. RESERVOIRS.—Two; Cap., 7,300,000 galls.; one 7,000,000; one 300,000. TANK.—Cap., 330,000 galls.; steel, 40 × 35 ft. DISTRIBUTION.—Services, galv. i.; paid for by owner. Hydrants, public, 27. MANAGEMENT.—Village Trustees. Village Clk., L. A. Veazie. Rept. by Geo. H. Davis, C. E. SEWERS.—Has sanitary sewers.

32. **RANDOLPH,** Orange Co. (1,573.) Built in '78 by village. SUPPLY.—Springs, 2½ miles distant, by gravity; gravel filters. RESERVOIRS.—Cap., 1,000,000 galls.; ½ mile from, 243 ft. above village. Press rept. Aug., '94, stated village had voted $6,000 for additional reservoir. FISCAL YEAR CLOSED May 5. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 300; made by village. Services, tarred iron; paid for by consumer. Meters, 0. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 105 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $21,000, at 4%. Sinking Fund, $2,000. Expenses: Operating, $500; int., $840. Revenue, $3,135: City, fire protection, $600; public buildings, $35; other purposes, $2,500. Rentals more than cover all expenses and pay off $1,000 to $2,000 of debt annually. MANAGEMENT.—Five Comrs. Chn. and Treas., Wm. H. Du Bois; Supt., Lemuel Richmond. Rept. by Supt., June 9.

33. **READSBORO,** Bennington Co. (910.) Built in '89 by village. SUPPLY.—Brook in town of Whitingham, by gravity to and from storage reservoir, and by pumping in case of fire or low water. PUMP.—Owned by Natl. Metal Edge Box Co. RESERVOIRS.—Cap., 675,000 galls. Impounding, 75,000; storage, 600,000. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 2¾ miles; cost extensions met by special tax or bonds. Taps, 46; made by village to sidewalk. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer, by consent of Supt. of works. Hydrants, public, 10; private, 6. PRESSURE.—Ordinary, 85 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $13,000. Floating debt, $9,000, at 5%; Bonded, $9,000 at 5%; due $1,000 in 1900; $5,000 in 1905; $3,000 in 1910. Deficits are all met from tax list. MANAGEMENT.—Prest., J. W. Harrington; Secy., B. A. Stowe; Treas., C. G. Brown; Acting Supt., James S. Pike. Rept. by Act. Supt., June 9. SEWERS.—Partial sanitary and storm systems.

34. **RICHFORD,** Franklin Co. (1,162.) Built in '89 by village. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 4.5 miles. Taps, 125. Hydrants, public, 29. FINANCIAL.—Cost, $16,609. MANAGEMENT.—Comr. NOTE.—No report since '90-1 Manual.

35. **ROCHESTER,** Windsor Co. (1,257.) Built in '95 by fire district for general supply. Engr., Thos. F. Chapelle, Rutland. SUPPLY.—Springs, by gravity from reservoir. FINANCIAL.—Cost (est.), $10,000. MANAGEMENT.—Prudential Com., W. M. Huntington and others. Rept. by E. H. Edgeston, Nov. 10.

36. **RUTLAND,** Rutland Co. (8,239.) Built in '56 by city. SUPPLY.—Mendon River, by gravity to and from settling and storage reservoirs. RESERVOIRS.—Cap., 8,000,000 galls.; at intake near river, two of 1,000,000 each and one of 6,000,000. DISTRIBUTION.—Mains, 42 miles. Taps, 2,215; made by city to curb line. Services, galv. i.; paid for by consumer. Hydrants, public, 128. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 60-80 lbs. One steam fire engine. FINANCIAL.—Cost (in '90), $140,000 (bonded debt has since increased by about $90,000). Bonded debt, $153,500: $36,500 at 5%, due $6,000 in '97, balance in '99; $117,000 at 4%, due 1924-5. Revenue, consumers, $24,299; City, none. MANAGEMENT.—Treas., W. L. Davis; Supt., J. M. Davis. Rept. by Supt., June 18. PROJECTED IMPROVEMENTS.—New stand-pipe. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 18, '95.

37. **ST. ALBANS,** Franklin Co. (7,771.) Built in '73 by city. SUPPLY.—Stream and springs, by gravity. RESERVOIRS.—Cap., 250,000,000 galls.; one 100,000,000; one 150,000,000. The smaller reservoir has area of 28 acres, is 336 ft. above village, connected with it by 12-in. w. i. and cem. pipe, 3½ miles long. Larger reservoir put under contract early in '92; on stream above old one; Engr. and Contr., Lucian A. Taylor, Boston, who also contracted to build new 24-in. supply main from old reservoir. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 32 miles. Taps, 990; made by city, free. Services, galv. i.; paid for by city to street line. Meters, 0. City cannot com-

pel, but may prohibit use of meters. Hydrants, public, 70; private, 5. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 125 lbs.; fire, 140 lbs. FINANCIAL.—Cost, about $275,000 (partial est. from village reports). Bonded debt, $179,000, at 4%, due $1,200 annually. Expenses: Operating, $3,600; int., $7,560. Revenue: Consumers, unmetered, $15,000. MANAGEMENT.—Com. Chn., H. C. Royce; Secy. and Treas., B. D. Hopkins; Supt., Chas. E. Collins. Rept. by Supt. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, March 4, '82.

38, D 11. **ST. JOHNSBURY,** Caledonia Co. (3,857.)

MUNICIPAL WORKS.

Built in '76 by village. SUPPLY.—Passumpsic River, direct pumping. Drainage area 1,000 acres. PUMPS.—Cap., 3,100,000 galls. 2 Flanders power pumps 600,000 and 1,000,000, respectively, Blake steam pump, 1,500,000. An 850,000 Deane dup. power was sold in '96 for use in connection with either this or the private works. Bituminous coal used; av. cost, $5.25 per short ton. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, not given; cost extension met by village appropriation. Taps, 300; made by village, free to street line. Meters, 2, owned, controlled and repaired by village. Use of meters optional with village; compulsory for motors. Have tried to introduce meters on every service for the last three years. Hydrants, public, 85; private, 3. CONSUMPTION.—(Galls.) av., 700,000; max., 800,000; min., 600,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $100,000. Floating debt, $1,500, at 6%; bonded, $45,000, at 4%, due in 5 and 10 yrs. Expenses: Operating, $2,400. Revenue: Consumers, $3,000. All deficits met by general taxation. MANAGEMENT.—Prest., G. P. Moore; Secy., W. L. Russell; Treas., E. D. Blodgett; Supt., R. G. Cheney. Rept. by Supt., July 4. PROJECTED IMPROVEMENTS.—Contract awarded to Deane Steam Pump Co. for a 1,000,000-gall. power pump. SEWERS.—Has sanitary and storm sewers.

E. & T. FAIRBANKS & CO.'S PLANT.

Built in '60 to supply Co.'s works, tenements and such other consumers as desire the water. Detailed information refused. Officers of company: Prest., Saml. N. Brown; Secy. and Treas., John C. Clark; Mgr., H. N. Turner. Report by Mgr. Aug. 26. REFERENCE.—Eng. News, March 4, '82.

D 12. **SPRINGFIELD,** Windsor Co. (1,512.) Works for domestic service, built in '84 by Albert Brown, under the name Springfield Village Water Supply Co. Town neither controls rates nor has the right to purchase works. Supply from four springs, by gravity. Mains, ½ mile. Taps, 24. Hydrants, 0. Cost, $2,000. No debt. Expenses nominal. Revenue, $250. Owner, Albert Brown, 131 Tyler St., Trenton, N. J. Rept. Aug. 28.

D 13. **STOWE,** Lamoille Co. (1,886.) Water is supplied to the majority of houses for domestic use by C. E. & F. O. Burt at an annual rental of $6. Rept. by Alice A. Raymond, Town Clk., Aug. 21.

39. **SWANTON,** Franklin Co. (3,231.) Now owned by village. Built in '87 by Swanton Water-Works Co., which acted as construction company, village taking works at cost and interest. SUPPLY.—Missisquoi River, pumping direct. PUMPS.—Lang triplex water power. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 7 miles. Taps, 190. Hydrants, public, 36. PRESSURE.—Ordinary, 80 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $25,000. Floating debt, $1,835; Bonded, $15,000, at 4%. Expenses: Operating, $1,075; int., $600. Revenue: Consumers, $2,600. MANAGEMENT.—Trustees. Prest., F. J. Hawley; Secy., H. A. Burt, Jr.; Treas., M. W. Barney; Supt., B. M. Bliss. Rept. by Treas. Sept. 25.

40. **UNDERHILL,** Chittenden Co. (1,301.) Built by T. W. Thorp for general supply; date not given, but press rept. indicates that it was in '94. SUPPLY.—Springs, by gravity. Press rept. mentioned reservoir as included in project.

41. **VERGENNES,** Addison Co. (1,773.) Built in '69 by city. SUPPLY.—Otter Creek, pumping direct. PUMPS.—Two Flanders water-power. FILTERS.—Cap., 200,000 galls.; gravel and sand. FISCAL YEAR CLOSED Mar. 5. DISTRIBUTION.—Mains, 3.5 miles; cost extensions met by city. Taps, 400. Services, iron; paid for by city. Meters, 0. Hydrants, public, 35; private, 3. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 80 lbs.; fire, 150 lbs. FINANCIAL.—Debt, $46,000, at 4%, due, $26,000 in 1908, $20,000 in 1914. Expenses: Operating, 1,075; int., $1,840. Revenue: Consumers, unmetered, $3,475. MANAGEMENT.—Treas., Thos. Muck; Supt. and Ch. Pump. Engr., C. A. Hoffnagle. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—A pressure filter. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Sept. 1, '83.

42, 43. **WATERBURY,** Washington Co. (955.)

WARREN & SOMERVILLE PLANT.

Built in '79 by Warren & Somerville Co. SUPPLY.—Springs, by gravity. DISTRIBUTION.—Mains, 7 miles. Taps, 300. Hydrants, public, 35. NOTE.—No report since '90-1 Manual. The figures under distribution appear too high, especially the number of hydrants, which for '89-90 Manual were reported as but 2.

MUNICIPAL WORKS.

Contracts let Jan., '96, by village to L. A. Taylor, Boston, Mass., according to statement by C. D. Robinson, member Water Com. Jan. 31, '96, H. W. Tillinghast, of Carroll & Tillinghast, 35 Broad St., New York City, stated that Mr. Taylor's bid was $31,550. Also that work included a small receiving reservoir 15 ft. square, 10 ft. deep; distributing reservoir, 75 × 125 ft., 10 ft. deep, about 12 miles supply and distributing mains and 35 hydrants. Press rept., Dec. 9, '95, stated village voted to incur indebtedness of $34,000 for works.

F 2. **WELLS RIVER,** Orange Co. (526.) Under construction for fire protection in '96 by village, which voted to build water and electric lighting plant, May 13. SUPPLY.—River, pumping direct, by means of 475,000-gall. Deane dup. water power pump. Hydrants, 20. Rept. by R. G. Brock, Village Clk., May 13, and Wm. G. Foss, Chn. Water Com., June 12, before beginning construction. Press repts. Nov. 27, '96, stated plant was nearing completion; also that $25,000 4% bonds, optional after 10 yrs., would be issued Jan. 1, '97, to cover both plants.

26. **WEST DERBY,** Orleans Co. (Not given.) Supplied from Newport.

D 14. **WESTMINSTER,** Windham Co. (1,265.) Built in '08; now owned by Westminster Aqueduct Co. Domestic service only. Springs, by gravity. Mains, 1 mile; cost extensions met by rentals and assessment. Taps, 30; made by Co. for $10. Services, lead; paid for by consumers. Meters, 0. Consumption (av.), 21,000 galls. Est. cost, $3,000. Expenses: Operating, $400; taxes, $25. Prest., R. D. Farr; Secy. and Treas., Henry C. Sane; Supt., Geo. W. Metcalf. Rept. by H. C. Sane, Aug. 18.

32. **WEST RANDOLPH,** Orange Co. Name changed to Randolph, which see.

D 15. **WHITE RIVER JUNCTION,** Windsor Co. (Not given.) Hartford Water Co. began works in '93 for general supply, but village refusing to rent hydrants project was crippled and domestic service, only, is furnished. Latter part of '96 property was "bid in" by Amos Barnes, The Brunswick, Boston. SUPPLY.—Springs, by gravity. There are three small reservoirs, about ⅓ mile 8-in., and 1¼ mile 2-in. pipe. A larger reservoir must be built and at least 1 mile 8-in. pipe laid, which will probably be done in "near future." Rept. by Mr. Barnes, Jan. 11, '97.

44. **WINDSOR,** Windsor Co. (1,884.) Present works built in '88 by village; first supplied in '50 by Windsor Aqueduct Co. Supply until recently from Dudley Brook, by gravity; this source was abandoned in '94 for a new supply for domestic use, although still used to furnish water for railways and motors. Engr. for new supply, F. C. Coffin, Boston. SUPPLY.—Springs, collected in a tank and pumped to stand-pipe (also see above). PUMPS.—Cap., 300,000 to 500,000 galls., Knowles. Pocahontas coal used. RESERVOIR.—Cap., 4,000,000 galls. STAND-PIPE.—Cap., 275,000 galls.; steel; 25 × 40 ft., on a hill. FISCAL YEAR CLOSED Mar. 1. Taps, 230; made by village at cost. Services, iron and lead; paid for by consumer. Meters, 1; owned by village. Use of meters compulsory for canning factory. Do not compel the use of meters as yet, but may in the future. Hydrants, public, 42; private, 3. CONSUMPTION.—(Galls.) av., 200,000 from stand-pipe. Considerable in addition used from the old system. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $49,405; Bonded debt, $25,000 at 4%; due July 1, 1909; $4,000 at 5% due 1908; 13,000 at 4% due Sept. 1, 1914, and $1,800 at 5% due on demand. Expenses: Operating, $1,976; int., $1,787. Revenue: Consumers, $3,986; City, fire protection, $1,200. MANAGEMENT.—Five Comrs. Rept. by Supt., G. S. Blake, Sept. 30. SEWERS.—Partial sanitary system. REFERENCE.—Eng. News, June 21, '90 (Dudley Brook dam and gate-house).

45. **WINOOSKI,** Chittenden Co. (3,659.) Built in '73 by Winooski Aqueduct Co. FRANCHISE.—Perpetual. Co. is exempt from local taxes. City to pay $30 per hydrant per annum. No legal difficulties. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 6,250,000 galls. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 5 miles. Taps, 400. Services, galv. i.; paid for by consumer. Meters: 30; owned by consumer. Use of meters optional with consumer, except compulsory for factories. Hydrants, public, 30; private, 1. PRESSURE.—Ordinary, 48 lbs.; fire, 200 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Common, authorized, $15,000; all paid-up; Pref'd. authorized, $45,000. MANAGEMENT.—Prest., Jos. Sawyer, 68 Chauncey St., Boston, Mass.; Secy., F. C. Kennedy, Burlington; Treas., T. F. Patterson, Boston, Mass.; Supt. and Engr., G. D. Nash. Rept. by Secy., July 14. PROJECTED IMPROVEMENTS.—Artesian wells.

46. **WOODSTOCK,** Windsor Co. (1,218.) Built in '87 by Woodstock Aqueduct Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not fixed in franchise nor subject to regulation by city. SUPPLY.—Streams, by gravity. RESERVOIRS.—Cap., 4,000,000 galls. DISTRIBUTION.—Taps, 166. Meters, 0. Hydrants, 38. FINANCIAL.—Cost, $40,000. NOTE.—No report since '90-1 Manual.

MASSACHUSETTS.*

1. **ABINGTON,** Plymouth Co. (4,260.) Built in '86 by town. Pumping machinery, 6 miles of mains and stand-pipe, owned jointly with Rockland. SUPPLY.—Big Sandy Pond in Pembroke, pumping to stand-pipe. Area pond, est., 110 acres. PUMPS.—Cap., 4,500,000 galls. Worthington hor. comp. high duty, 2,000,000 galls. Barr vertical, 2,500,000 galls. Bituminous coal used; av. cost, $5 per short ton. STAND-PIPE. Cap., 367,000 galls.; steel, 25 × 100 ft.; on Beach Hill in Rockland, 5 miles from, 230 ft. above, the pond; 129 ft. above Rockland, 135 ft. above Abington. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 20 miles; cost extensions met by appropriations. Taps, 808; made by town to curb. Services, cement lined; paid for by town to property line. Meters, 200; owned by consumer. Use of meters: town can compel the use of meters and any consumer may have one. Hydrants, public, 142. CONSUMPTION.—(Galls.) av., 400,000; max., 1,250,000; min., 250,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $173,000. Bonded debt in '90, $146,000, at 4%, due in '91—1918. Expenses: Operating, $9,457.12. Revenue, $7,876.58; City, fire protection, $2,840. MANAGEMENT.—Three comrs., Chn., Jos. L. Greenwood; Secy., Geo. A. Beal; Town Treas., G. R. Farrar; Supt., Aug. H. Wright; Ch. Pump. Engr., Wm. S. Daby. Rept. by Supt., June 8. REFERENCE.—Eng. News, Aug. 22, '85.

2. **ADAMS,** Berkshire Co. (9,213.) Built in '73 by fire district. SUPPLY.—Bassett and Dry Brooks, by gravity from impounding reservoir; also emergency supply from wells, at Renfrew Mills, pumping to reservoir. Drainage areas, est., 8.44 sq. miles; Bassett, 2.6; Dry Brook, 7.84. RESERVOIRS.—Cap., 10,000,000 galls.; 5,000,000 on each stream. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by water rents and taxation. Taps, 140; reported as 1,800 in '89; made by fire district, free. Services, galv. i.; paid for by consumer. Meters, 15; owned, controlled and repaired by fire district. Use of meters compulsory for mills, liveries and fish markets. Town can compel the use of meters and any consumer may have one. Hydrants, public, 186. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary, 160 lbs.; fire, 110 lbs. FINANCIAL.—Cost (in '87), $140,878. Bonded debt, $90,000, at 5%; due, $5,000 every year. Revenue: Consumers, $12,616. MANAGEMENT.—Secy. and Treas., F. W. Spalding; Supt., C. A. Waters. Rept. by Secy., Sept. 28.—PROJECTED IMPROVEMENTS.—New source of supply, reservoir, etc. REFERENCES.—Eng. News, March 17, '83.

D 1. **AGAWAN,** Hampden Co. (2,352.) Built in '77, for domestic use only, by C. L. Goodhue, Springfield. Supply springs, by gravity. DISTRIBUTION.—Mains, 5 miles. Taps, 74. Meters, 0. Hydrants, 0. FINANCIAL.—Cost, $6,000. No debt. Rept. by owner, C. L. Goodhue, Springfield. REFERENCE.—Eng. News, Sept. 16, '82.

3. **AMESBURY,** Essex Co. (9,798.) Built in '34 by Powow Hill Water Co. to supply Amesbury and Salisbury. In '86 large part of Amesbury was annexed to Salisbury. FRANCHISE.—Provides for purchase of works by city at any time. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $30 per hydrant for first 100 hydrants; all above that number $25 per yr. each. Hydrant service for 20 yrs. from '83. No legal difficulties. SUPPLY.—Driven wells, from 30 to 98 ft. deep, pumping to reservoirs. In '90 there were 14 2-in. wells sunk, 16 ft. from the bottom of an open basin, 14 ft. deep; also supplementary basin, 40 × 80 ft. PUMPS.—Cap., 4,000,000 galls., Worthington; two 1,000,000 non-comp. non-cond. and one reserve 2,000,000 comp. cond. Cumberland coal used; av. cost, $4 per short ton. RESERVOIRS.—Cap., 1,750,000 galls.; 2 distributing; 1,250,000 galls. for fire protection, only; 500,000 galls. for domestic service. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (in '90), 9 miles; cost of extensions met by earnings. Taps, 800; made by Co. to sidewalk. Services, lead lined; paid for by owner of property. Meters, 70; owned by consumer. Use of meters optional with consumer by permission of Co. Hydrants, public, 140; private, 1. CONSUMPTION.—(Galls.) av., not given. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cap. Stock, authorized, $75,000, all paid-up. Bonded debt, $40,000, at 5%, due 1905. MANAGEMENT.—Prest., Wm. E. Biddle; Treas., E. Ripley Sibley; Ch. Pump. Engr., Bailey Osgood. Rept. by Treas., June 6. PROJECTED IMPROVEMENTS.—Expenditure of $10,000 for additional water supply. SEWERS.—Partial system of sanitary and storm. REFERENCE.—Eng. News, Apr. 18, '85.

4. **AMHERST,** Hampshire Co. (4,512.) Built in '79 by Amherst Water Co. In '87 or '88 Co. bought out Pelham Spring Co., which built works in '83. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Amethyst Brook and springs in Pelham, by gravity. Drainage area, brook, 8 sq. miles. RESERVOIR.—Cap., 2,800,000 galls.; 2,700,000 impounding; 100,000 collecting for springs, covered. FISCAL YEAR CLOSED May 6. DISTRIBUTION.—Mains, 12 miles. Taps, 350. Hydrants, public, 54. PRESSURE.—100 lbs. FINANCIAL.—Cost, $82,338; Cap. Stock, authorized, $40,000, all paid-up; Bonded debt,

*Additional information regarding the water-works of Massachusetts, especially their sanitary phases, including many chemical and biological analyses, is given in the reports of the Massachusetts State Board of Health, beginning with the large special Report on Water Supply, issued in 1890.

$40,000, at 5%. Revenue, $1,000. MANAGEMENT.—Prest., E. F. Cook; Treas., E. D. Bangs; Supt., W. W. Hunt. NOTE.—Above figures are same as given in '90-1 Manual, and were stated to be correct for '96 by Treas. on Sept. 28. REFERENCE.—Eng. News, Nov. 4, '82.

5. **ANDOVER,** Essex Co. (6,142.) Built in '89-90 by town; put in operation Mar. 12, '90; fire protection system built in '86. SUPPLY.—Haggett's Pond, pumping to reservoir. Pond about 3 miles from village; area, 160 acres; drainage area pond about 2.43 sq. miles. PUMPS.—Cap., 3,500,000 galls. Blake comp. dup. and Deane vert. fly-wheel, comp. dup. cond., 1,750,000 each. Force main, 12 in. Maryland Co.'s Georgia Creek Cumberland coal used; av. cost, $4.24 per short ton. RESERVOIRS.—Cap., 1,300,000 galls. FISCAL YEAR CLOSED Jan. 15. DISTRIBUTION.—Mains, 24 miles; cost extensions met by bonds. Taps, 706; made by town, free to street line. Services, lead lined; paid for by consumer to street line. Meters, 278; owned by consumer; controlled by town; repairs paid by consumer; yearly rental $2. Use of meters compulsory for manufacturers and all large consumers. Town can compel the use of meters and any consumer may have one. Hydrants, public, 182; private, 18. CONSUMPTION.—(Galls.) av., 321,520; max., 560,000; min., 218,000. PRESSURE.—Ordinary, 70 lbs.; fire, 110 lbs. Steam fire engines are used on high levels. FINANCIAL.—Cost, $188,080. Bonded debt, $125,000, at 4%, due $5,000 a yr. to 1919, $10,000 per yr. in 1920, '22, '23. Sinking Fund, $2,547, deposited in savings banks at about 4¼% average. Expenses: Operating, $4,880; int., $6,880. Revenue: Consumers, $8,434. All deficits except construction are paid by tax levy and all receipts are paid into town treasury. MANAGEMENT.—Prest., John H. Flint; Secy., Felix G. Haynes, Ballard Vale, Mass.; Treas., Geo. A. Parker; Supt., John E. Smith; Ch. Pump. Engr., Geo. W. Spickler. Rept. by Supt., June 5.

6. **ARLINGTON,** Middlesex Co. (5,629.) Built in '78 by town, which in '71 bought rights of Arlington Lake Water Co., incorp. same year to supply town. High service works added in '94-5; Engr., F. L. Fuller, 12 Pearl St., Boston, Mass. SUPPLY.—Ground and surface water, by gravity, for low service; driven wells, pumping to stand-pipe for high service. Filter gallery, 12 × 135, and parallel gallery 4 ft. wide, 235 ft. long, near Lexington Great Meadows reservoir. In '92 20-in. pipe was laid from North Brook, above reservoir, to connect with gallery, so reservoir, which has peaty bottom, need be drawn on only when gallery and brook proved inadequate. In '95 25 2½-in. tubular wells were completed on edge of Great Meadows; av. depth, 35 ft. PUMP.—Cap., 720,000 galls.; Blake comp. Pocahontas coal used; av. cost, $3.75 per short ton. RESERVOIRS.—Cap., 77,000,000 galls.; area, 31 acres; depth, 10 ft.; drainage area, 2,700 acres. Also (in '90) shallow reserve reservoir on Great Meadows. STAND-PIPE.—Cap., 562,000 galls.; iron, covered, 40 × 60 ft.; 270 ft. (press rept.) above pumping station. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 30 miles; cost extensions met by town appropriation and income. Taps, 1,200; made by town, free. Services, cement lined; paid for by town. Meters, 15; owned, controlled and repaired by town; yearly rental, $3. Use of meters optional with town; compulsory for farmers, greenhouses and motors. Hydrants, public, 264. PRESSURE.—Ordinary, 90 lbs.; fire, 170 lbs. FINANCIAL.—Cost, $732,388, including interest. Bonded debt, $349,000; $74,000 at 5%, $275,000 at 4%. Expenses: Operating, $11,000; int., $14,700. Revenue: Consumers, $18,101.62; City, fire protection, $4,000; other purposes, $38,318, including appropriations. MANAGEMENT.—Prest., F. W. Hodgden; Secy. and Treas., B. Delmont Locke; Supt., Thos. Roden; Ch. Pump. Engr., Albert E. Smith. Rept. by Supt., July 19. SEWERS.—Sanitary sewers under construction. REFERENCE.—Eng. News, Dec. 30, '82.

7. **ASHBURNHAM,** Worcester Co. (2,074.) Now owned by I. W. Adams & Co. (under name of Naukeag Water Co.?) Built in '70 by Ashburnham Reservoir Co. SUPPLY.—Springs, by gravity from impounding reservoir. RESERVOIR.—Cap., 500,000 gall.; ½ mile from, 100 ft. above village. FISCAL YEAR CLOSED Dec., '95. DISTRIBUTION.—Mains, not given; cost extensions met by Co. Taps, 60; made by Co. Services, lead; paid for by house owners. Meters, 0. Co. has no authority to compel the use of meters. Hydrants, public, 16; private, 1. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cap. Stock, authorized, $5,000. MANAGEMENT.—Prest., I. W. Adams, Boston; Secy., Walter R. Adams; Treas., M. A. Ames. Rept. by Treas., July 15. REFERENCE.—Eng. News, Nov. 22, '84.

P 1. **ASHLAND,** Middlesex Co. (2,532.) Town Clk., Wm. F. Merritt, rept. Sept. 3, '96, that surveys had been made for works est. to cost $53,000. Legislative authority had not been secured. Pump and tank proposed.

8. **ATHOL,** Worcester Co. (6,319.) Built in '76 by Athol Water Co. FRANCHISE.—25 yrs. from '77. Provides for purchase of works by town after '93, at price determined by arbitration. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. SUPPLY.—Phillipston and Buckman Brooks, by gravity, with pumping as noted below. Since '90 a well, 12 × 40 ft., 12 ft. deep, has been dug in meadow, 1,000 ft. below impounding reservoir, from which water is pumped into reservoir. PUMPS.—Cap., 1,000,000. Deane dup. added in '98. Bituminous coal used; av. cost, $4.45 per short ton. FILTERS.—Cap., 1,500,000 galls.; Blessing (or New York). RESERVOIRS.—Cap., 79,000,000 galls. Phillipston, impounding, 60,000,000; area, 20 acres; depth, 15 ft.; 400 to 500 ft. above town Newton impounding, 15,000,000; Summer St. and Pleasant St., distributing, 2,000,000 each.

FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 28.5 miles. Taps, 820; made by Co. free. Services, galv. w. i.; paid for by consumer. Meters, 30; owned, controlled and repaired by Co. Use of meters compulsory for hotels, steam users, motors and livery stables. Hydrants, public, 63; private, 6. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—150-75 lbs. Steam fire engines are used outside of service limits and on high elevations. FINANCIAL.—(In '90) Cost, $150,000. Cap. Stock, authorized, $80,000, all paid up. Bonded debt, $40,000, at 6%, due about 1905. Expenses, $3,900: Operating, $1,200: int., $2,400; taxes, $300. Revenue, $10,700: Consumers, $7,900; City, fire protection, $2,800 ($3,150 in '95). MANAGEMENT.—Prest., Arthur W. Merrill, Portland, Me.; Treas., Geo. F. West, Portland, Me.; Supt., Warren G. West. Rept. by Supt., Aug. 15. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, May 18, '82.

9. **ATTLEBOROUGH,** Bristol Co. (7,577.) Built in '73 by town. Supplies also villages of Hebronville, Dodgeville and South Attleborough. Press repts. state that appropriation for extension was voted in Apr., '94. SUPPLY.—Well near Seven-Mile River, pumping to stand-pipe. Well is 150 ft. from river, just above Orr's Mill Pond; 35 ft. in diam. at top, 25 ft. deep; covered. PUMPS.—Blake and 1,500,000 dup. comp. cond. Deane. A 1,000,000 Worthington reported by makers as being or having been in use. George's Creek bituminous coal used; av. cost, $4.18 per short ton. STAND-PIPE.—Cap., 668,000 galls.; 30 × 125 ft.; iron, plates ⅞-in. thick at bottom, ⅝ at top; iron roof. Erected by means of floating stage. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 28.6 miles; cost extensions met by bonds. Taps made by town. Services, galv. i.; paid for by consumer from sidewalk to house. Meters, 638; owned by town, 385; consumer, 253; controlled by town; yearly rental, $2 for ⅝-in. Use of meters: Town can compel use of meters and any consumer may have one. Hydrants, public, 224. CONSUMPTION.—(Galls.) av., 306,357; max., 564,000. PRESSURE.—Ordinary, 50 to 62 lbs. FINANCIAL.—Cost, $281,850. Bonded debt, $40,000 at 7%, due in 1904; $190,000 at 4%. Sinking Fund, $25,758. Expenses: Operating, $6,434; int., $10,400, and on sinking fund, $4,650. Revenue, $21,513: Consumers, $14,188; City, fire protection, $6,800; other purposes, $525. Deficits are met by taxation to amount of $7,325, which covers all public service for street sprinkling, hydrant rental and public buildings. MANAGEMENT.—Comrs. Supt., Wm. J. Luther; Ch. Pump. Engr., Geo. H. Palmer. Rept. by Supt., Aug. 13. REFERENCE.—Eng. News, May, 27, '82.

10. **AVON,** Norfolk Co. (1,384.) Built in '89 by town. SUPPLY.—Porter's Spring, covered, pumping direct and to stand-pipe. Spring was developed by sinking well 20×22 ft., about 15 ft. from spring, after which latter was sealed by concrete. PUMPS.—Cap., 1,000,000 galls. Blake, dup. comp. cond. Cumberland coal used; av. cost, $4.24 per short ton. STAND-PIPE.—Cap., 212,000 galls.; w. i., 20 × 90 ft., bottom ⅝-in., sides ⅝ to ¼-in. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5¾ miles; cost extensions met by bonds. Taps, 274. Services, iron, cem. lined; paid for by owner of property. Meters, 6; owned by town; yearly rental, $1.80. Use of meters optional with town; compulsory for factories. Hydrants, public, 51. CONSUMPTION.—(Galls.) av., 61,921. PRESSURE.—65 lbs. Steam fire engines are used. FINANCIAL.—Cost, $56,000. Bonded debt, $49,500, at 4%. Expenses: Operating, $1,806; int., $1,984. MANAGEMENT.—Prest., David H. Blanchard; Secy., John Collins; Treas. and Supt., Nathan Tucker; Ch. Pump. Engr., F. H. Goldthwait. Rept. by Supt., June 8. REFERENCE.—Eng. News, Sept. 3, '96 (yield of springs), illus.

11. **AYER CITY,** Middlesex Co. (2,148.) Built in '87 by town; put in operation Dec. 15 (formerly reported as built in '88.) SUPPLY.—Collecting well near outlet of large mill pond, pumping to reservoir, with emergency supply from brook. Well is about 25½ × 26 ft. deep, last 7 ft. in rock. PUMPS.—Cap., 480,000 galls. Davidson; water-power used in '90 to drive either this or another pump. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 6¾ miles. Taps, 229. Meters, 40. Hydrants, public, 48. CONSUMPTION.—(Galls.) av., 73,600. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $73,850. Bonded debt, $60,000, at 4%. Expenses: Operating, $1,800; int., $2,500. Revenue, $4,500. MANAGEMENT.—Three Comrs.; Chn., L. J. Spaulding; Water Registrar, Arthur Fenner. Rept. by Chas. C. Bennett, in Sept.

12. **BARRE,** Worcester Co. (2,289.) Built in '95 by Barre Water Co. Engr., Chas. A. Allen, Worcester. Contr., John E. McClellan, Grafton. Charter provides for purchase of works by city at anytime on a ⅔ vote at a meeting called for the purpose; town to pay actual cost of franchise, works and property, with 5% int. on same, plus excess of expense over income in year, or minus reverse. No legal difficulties. SUPPLY.—Springs, by gravity from impounding or collecting reservoir. Springs in two groups, with combined drainage area of 275 acres. Water brought from second group to reservoir through 700 ft. of open trench and 2,100 ft. of open pipe. RESERVOIRS.—Cap., 12,000,000 galls.; area, 4.25 acres; depth 10 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by bonds. Taps, 35. Services, iron, cem.-lined; paid for by Co. to curb line. Meters, 7; owned by consumer; controlled by Co.; repairs paid by consumer. Use of meters compulsory for hotels and institutions. Co. can compel use of meters and a consumer may have one by vote of directors. Hydrants, public, 21; private, 2. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—68 lbs. Steam fire engines are used when necessary. FINANCIAL.—Cost, $35,000. Cap. Stock, authorized, $2,000; all paid-up. Floating debt, $10,000. Bonded, $10,000, at 5%. Ex-

penses: Operating, $300; taxes, $210; City, fire protection, $750; other purposes, $400. MANAGEMENT.—Prest., Geo. A Brown; Secy., Harding Jenkins; Treas., F. A. Rich; Supt., Geo. W. Cook. Rept. by Geo. W. Cook, June 10. PROJECTED IMPROVEMENTS.—Rip-rapping banks of reservoir.

18. **BELMONT,** Middlesex Co. (2,098.) Built in '87 by town. SUPPLY.—From Watertown Water Supply Co., under 5-yr. contract (press rept.) from '92, terminable on either side at short notice. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 9.5 miles. Taps, 188. Meters, 13. Hydrants, 69. FINANCIAL.—Cost, $56,814. Bonded debt, $39,750, due: $19,250, 1897-1907; $6,500, 1897-1909; 6,000, at 4%, 1921; $8,000, at 4%, due 1925; int., $1,710. Water Co. makes all collections and for use of mains returns 50% of same, including hydrant rental, $17.50 each. MANAGEMENT.—Comrs. Prest., Henry S. Harris. Rept. by Town Treas., W. L. Cheney, Sept. 28. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston.

14. **BEVERLEY,** Essex Co. (10,821.) Distribution system built in '67; supply taken from Salem Works till '87, when town built reservoir and pumping station. SUPPLY.—Wenham Lake, pumping direct and to reservoir. PUMPS.—Cap., 4,000,000 galls.; two 2,000,000 Holly-Gaskill. Cumberland coal used; av. cost, $3.43 per short ton. RESERVOIRS.—Cap., 3,250,000 galls. Distributing 174 ft. above tide. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 60 miles; cost extensions met by yearly appropriation. Taps, 2,872; made by city. Services, galv. i. Meters, 52; owned, controlled and repaired by city. Use of meters compulsory for manufacturers. Consumers may not have meters without consent of city. Hydrants, public, 235. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $368,525. Sinking Fund, $3,000. Expenses: Operating, $11,625. Revenue: Consumers, $32,122. MANAGEMENT.—Prest., Peter E. Clark; Secy., Geo. Swan; Supt., Chas. W. Picket; Ch. Pump. Engr., John H. Hodskinson. Rept. by Supt., Aug. 3. SEWERS.—Has sanitary and storm sewers.

P 2. **BILLERICA,** Middlesex Co. (2,380.) Com. appointed in spring of '96 to investigate and rept. on works: J. Nelson Parker, Frederic S. Clark and C. H. Kohlrausch. No definite action expected until Mar., '97.

P 6. **BLACKSTONE,** Worcester Co. (6,138.) See Millville.

D 2. **BLANDFORD,** Hampden Co. (871.) Built in '94 by M. Henry, T. W. Boise and W. H. Oatley for domestic supply. Co. not exempt from local taxes. Supply, 6-in. driven well, pumping to tank; pump driven by wind engine. Tank, cap., 21,000 galls.; wood, on trestle 10 ft. high. Mains, ½ mile. Taps, 6; no fee. Services, iron. Meters, 0. Hydrants, private, 3. CONSUMPTION.—(Galls.) av., 1,000. Cost, $3,200. Expense: Operating, $50. Prest., Myron Henry, 95 Liberty St., N. Y. City; Secy. and Treas., T. W. Boise; Supt., W. H. Oatley. Rept. by Supt.

15, 16. **BOSTON,** Suffolk Co. (448,477.)

First supplied in 1652 by "Water-Works Co." In 1796 the Jamaica Pond Aqueduct Co. was incorp. and soon after began to supply water and furnished principal supply until city built works, after which it continued to supply Roxbury district of Boston until bought by city in '93. Cochituate supply introduced by city in '48, and supplemented by Sudbury supply in '78. In '74 annexation of Charlestown gave city Mystic Works, built in '64; these works also supply Chelsea, Everett and Somerville. MANAGEMENT.—Comr., Jno. R. Murphy; City Engr., Wm. Jackson. Rept. by City Engr., Aug. 19, '96. SEWERS.—Has sanitary and storm sewers.

COCHITUATE AND SUDBURY DEPARTMENT.

SUPPLY.—Lake Cochituate and Sudbury River, by gravity, with pumping for high service. Drainage area, 94.07 sq. mi.; Lake Cochituate, 18.87; Sudbury, 75.2. PUMPS.—Cap., 36,000,000 galls. Two 8,000,000 Holly-Gaskill hor. high duty and 1 Leavitt, 20,000,000. Bituminous broken coal used; av. cost, $4.27, $3.92½ and $3.90 per short ton. FILTERS.—At mouth of Pegan Brook and at outlet of Reservoir No. 6, to purify the water of those sources. STORAGE RESERVOIRS.—Available cap., 8,480,000 000 galls.: No. 1, 280,000,000; No. 2, 530,000,000; No. 3, 1,080,000,000; No. 4, 1,400,000,000; No. 6, 1,530,000,000; No. 8, 1,250,000,000; Farm Pond, 160,000,000; Lake Cochituate, 2,000,000,000; Dudley Pond, 250,000,000. Besides these, No. 5, will be completed in '97, with cap. of 7,000,000,000 galls. Three of the largest dams are 70 ft. high and about 1,800 ft. long. AQUEDUCTS.—Sudbury: Dy. cap., 100,000,000 galls.; 15.9 miles long; 9 ft. wide, 7⅞ ft. high; equivalent to circular conduit 8½ ft. in diam.; fall, 1 ft. per mile. The dimensions apply to full length of aqueduct, except 1½ miles at upper end, where fall is 2.323 ft. per mile; width, 7 ft.; height, 6.88 ft. Cochituate: Dy. cap., 20,000,000 galls.; 14.6 miles long; egg-shaped, with large end down, 5 ft. wide and 6½ ft. high. DISTRIBUTING RESERVOIRS.—Low service: Chestnut Hill, 731,000,000; Brookline, 115,000,000; East Boston, 5,500,000; total, 851,500,000 galls. High service: Fisher Hill, 15,500,000 galls.; Parker Hill, 7,200,000; West Roxbury and East Boston stand-pipes, 250,000; total, 28,450,000 galls. STAND-PIPES.—See reservoirs. FISCAL YEAR CLOSED Jan. 31, '96. DISTRIBUTION.—Mains, 596 miles. Taps, 70,879; made by city. Services, lead; paid for by consumer. Meters, 4,398; owned, controlled and repaired by city. Hydrants, public, 6,459. CONSUMPTION.—(Galls.) av., 50,801,100; max., 58,905,100;

min., 46,470,500. PRESSURE.—Ordinary, high service, 50-80 lbs.; low service, 15-40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $24,452,228. Balance financial figures for '94-95. Bonded debt, $17,761,274, at from 3½ to 6%. Sinking Fund, $8,444,778. Expenses: Operating, $440,840. Revenue $2,316,879: Consumers, unmetered, $1,644,-405; metered, $672,474. NOTE.—The dams, reservoirs and aqueducts of the Cochituate and Sudbury Department will become a part of the Metropolitan Water Supply in '98. Desmond FitzGerald is Gen. Supt. and Engr. of this part of the system.

MYSTIC DEPARTMENT.

Supplies Charlestown, Chelsea, Everett and Somerville. SUPPLY.—Mystic Lake, by gravity to pumping station, thence pumping to reservoir. Drainage area, 27.75 sq. miles. PUMPS.—Cap., 28,000,000 galls. Three Worthington, two of 5,000,000 each; one of 8,000,-000; one Leavitt, 10,000,000 galls. Bituminous broken coal used; av. cost, $3.63, $3.59 and $3.34 per short ton. RESERVOIRS.—Cap., 406,000,000 galls. Mystic Lake, storage, 380,000,000; Mystic Reservoir, distributing, 26,000,000. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 179 miles. Taps, 24,119; made by city. Services, lead; paid for by consumer. Meters, 504; owned, controlled and repaired by city. Hydrants, public, 1,543. CONSUMPTION.—(Galls.) av., 9,457,000; max., 12,953,200; min., 8,098,000. PRESSURE.—Ordinary, 50 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,-803,775. Bonded debt ('93-94), $102,000. Sinking Fund ('93-94), $265.210. Expenses: Operating ('94-5), $141,446. Revenue (in '94-5), $563,365: Consumers, unmetered, $447,-554; metered, $115,811.

REFERENCES, BOTH DEPARTMENTS.—(From Engineering News.) General: Jan. 3, 10, 17, 24, 31, Feb. 14, 21, Mar. 7, 21, 28, Apr. 4, 11, 18, 25, May 16, '78; Apr. 2, 9, '81; Oct. 26, '93; Mar. 7, '95, illus. Watershed: Oct. 20, '92, with diagrams; Mar. 7, '95. Dams: Apr. 4. '95 (Southboro), with inset. Aqueducts: Apr. 26, '84; May 3, '84; June 9, '92; Feb. 8, '94. Reservoirs: Mar. 24, '88 (Fisher Hill); Mar. 8, '94, illus. Filter beds: June 28, '94 (Pegan Brook), illus. Pumping engines: Dec. 22, '92; Aug. 30, '94 (Leavitt). Raising of water main, Jan. 23, '86.

METROPOLITAN WATER SUPPLY.

Metropolitan Water Board was constituted in '95 to construct, maintain and operate works providing a sufficient supply of pure water to the following cities and towns: Belmont, Boston, Chelsea, Everett, Hyde Park, Malden, Medford, Melrose, Newton, Revere, Somerville, Watertown and Winthrop, and such other municipalities within a radius of 10 miles from the State House at Boston as may, on application, be admitted to the district. Up to Jan 16, '97, no other municipalities had been admitted to the district, but Quincy had voted in favor of entering and several others were considering the matter. The general plans for these works is in accordance with a report made by the Massachusetts State Board of Health in '95, after extended investigations, under the direction of the then Chief Engineer of the Board, F. P. Stearns. The supply will be from the South Branch of the Nashua River, taken from a dam at Clinton, combined with the present Sudbury and Cochituate supply works of Boston, the two sources, in a series of dry years, having daily capacities of 105,000,000 and 68,000,000 galls. respectively. A dam is being built at Clinton to form a 63,000,000,000-gall. reservoir, flooding about 6½ sq. miles. From this an aqueduct 12 miles long, with a daily carrying cap. of 300,000,000 galls., is being built to carry the impounded water to Basin 5 of the Boston Water-Works in Southborough and Marlborough, now under construction, and to have a cap. of 7,500,000,000 galls. and an area of 2 sq. miles. From this reservoir water will pass through the present Boston aqueducts, which, with the other portions of the Sudbury and Cochituate supply works, not included in the Boston distributing system, are to be acquired by the Metropolitan Water Board. Pumping stations will be built at Chestnut Hill and elsewhere to deliver water with ample pressure to all parts of the system, and large supply mains will be laid from this point. The Board was appointed in July, '95, by the Governor, as follows: Henry H. Sprague, Boston, Chn.; Wilmot R. Evans, Everett; Jno. R. Freeman, Winchester. Mr. Freeman afterwards resigned and the vacancy was filled by Mr. Henry P. Walcott, Chn. Mass. State Board of Health. The heads of the Engineering Corps are as follows: Consult. Engrs., Jos. P. Davis, Boston, and A. Fteley, New York; Chf. Engr., Frederic P. Stearns; Engr. Distribution Dept., Dexter Brackett; Engr. Sudbury Dept., Desmond FitzGerald; Engr. Dam and Aqueduct Dept., Thos. F. Richardson; Engr. Reservoir Dept., Hiram A. Miller; Principal Office Asst., Reuben Shirreffs. REFERENCES.—General review of system, with map and general details of dam, abstracted from special rept. Mass. State Board of Health, Eng. News, Mar. 7, '97; Nashua Aqueduct, illus., Eng. News, Jan. 23, '96. NOTE.—Since above was put in type contract has been let for 30,000,000-galls. Allis vert. triple exp. pump to be placed at Chestnut Hill pumping station.

17. **BRADFORD.** Essex Co. (3,720.) Purchased by city in '95, city taking possession Apr. 1. Built in '89-90 by Bradford Water Co. SUPPLY.—Wells, pumping to reservoir and direct. At end of '95 works to introduce water from Johnson's Pond had been partially completed, but not put in use. In '91 there were ten wells in use, of which nine were along a line extending 1,200 ft. along Porter's Island in the Merrimack River and one near the middle of the island; 8 wells are 12 ft. and 4 are 12 × 24 ft., these 7 being

20 ft. deep; one is 24 × 12 ft., 18 ft. deep, one 24 ft. sq., 18 ft. deep, and one 23 ft. sq. and 22 ft. deep. Two wells not described were added to above in '92. All have wooden curbs and are covered with loose plank. PUMPS.—Cap., 3,000,000 galls.; Worthington, comp, cond., 1,000,000; Deane dup., 2,000,000. RESERVOIR.—Cap., 1,000,000 galls.; also a small covered reservoir, 40,000 galls., 24 ft. in diam., 11 ft. deep. DISTRIBUTION.—Mains, 13¾ miles. FINANCIAL.—Bonded debt, $141,000; interest, $6,126. Revenue, $8,989.

18. **BRAINTREE,** Norfolk Co. (4,848.) Purchased by town in '91. Built in '87 by Braintree Water Supply Co. See Manual for '90-91, for complications regarding purchase and works town started to build just before taking Co.'s works. SUPPLY.—Filter gallery on shore of Little Pond in South Braintree, with connection with pond for emergency use, pumping to stand-pipe. A 12-in. pipe connection made with pond in '93, but used only 43 hours that year. Gallery is covered, 100 × 15 ft., with bottom 16½ ft. below high water in pond. Pond has area of 75 acres, when full, but owners of water privilege have right to lower it 6 ft., when area is said to be 48 acres; drainage area, 350 acres. PUMPS.—Cap., 2,000,000 galls. (or more); two 1,000,000 Blake. STAND-PIPE.—Cap., 528,700 galls.; 30 × 100 ft.; no roof. DISTRIBUTION.—(In '90) Mains, 14 miles. Taps, 490. Hydrants, 100. FINANCIAL.—Cost, $159,610 paid Co. in '91 and also $17,000 on account of work done by contrs. on town plant. MANAGEMENT.—Comrs. NOTE.—No report since '90-91 Manual. Press repts. indicate that steps were taken in Sept., '96, to put down driven wells near filter gallery.

19. **BRIDGEWATER AND EAST BRIDGEWATER,** Plymouth Co. (Brigdewater 4,249; E. Bridgewater, 2,911.) Owned by Bridgewater's Water Co., Boston. Built in '87 by National Water-Works Syndicate, Boston. SUPPLY.—From wells, in Bridgewater, near Tom's River, pumping to stand-pipe. Wells: (1) 25 × 60 ft., 17 ft. deep, having semi-circular ends; (2) 25 ft. in diam. and depth; (3) 25 × 27 ft., cased with boiler iron, and having 6-in. well sunk 86½ ft. in bottom; (4) 15 6-in. wells, 100 to 200 ft. deep. Wells (1) and (2) are covered. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 comp. cond., Worthington. Pumping station about midway between towns. STAND-PIPE.—Cap., 270,000 galls.; 25 × 75 ft. DISTRIBUTION.—Mains, 23 miles. Taps, 361. Hydrants, 60. FINANCIAL.—Cost, $206,550. Cap. Stock (in '92), $100,000, all paid-up. Debt (in '92), $135,961. Expenses, $7,988: Operating, $2,420; int., $5,273; taxes, $290. Revenue, $7,500: Consumers, $5,700; City, $1,800. NOTE.—No rept. since '90-1 Manual. Cap. stock and debt from Mass. Corp. repts. for '92; statement for June 14.

20. **BROCKTON,** Plymouth Co. (27,294.) Built in '80-1 by city. SUPPLY.—Impounding reservoir on Salisbury brook, by gravity to low service and pumping to stand-pipe for high service. Drainage area, 3.12 sq. miles. New supply main laid in '94, "after rept." of Engr. L. E. Hawes, Tremont Building, Boston. PUMPS.—Cap., (with '96 addition), 8,000,000 galls. 3,000,000 Worthington comp. cond.; 5,000,000 Holly vert. triple exp., erected in '96. Georges Creek Cumberland coal used; av. cost, $4.20 per short ton. FILTER.—55,000 sq. ft. of bottom of reservoir was laid with 4-in. drain tiles, 8 ft. c. to c., 30 ins. below surface. Water derived was so impregnated with iron that use of system was discontinued. RESERVOIRS.—Cap., 288,000,000 galls. Impounding, in town of Avon, area, about 90 acres, three miles from and 122 to 18 ft. above city. STAND-PIPE.—Cap., 1,247,000 galls. steel; 59 × 61 ft.; aerating pipes are provided in bottom of tank. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 55 miles. Taps, 4,245; made by city free. Services, w. i. cem. lined; paid for by city to street line. Meters, 2,963; owned, controlled and repaired by city. Use of meters compulsory for only those who use sill faucet. City can compel the use of meters and any consumer may have one. Hydrants, public, 481; private, 7. CONSUMPTION.—(Galls.) av., 1,098,560. PRESSURE.—Ordinary and fire, 47-56 lbs. Steam fire engines are used. FINANCIAL.—Cost, $752,882. Bonded debt, $695,000. Sinking Fund, $187,000. Expenses, $35,126: Operating, $8,826; int., $26,300. Revenue, $46,769: Consumers unmetered, $10,441; metered, $33,328; City, fire protection, $3,000. No deficits. MANAGEMENT.—Chn., E. H. Reynolds; Clk., F. B. Gardner; Treas., Wm. H. Emerson; Supt., Horace Kingman; Rept. by Supt., June 5. PROJECTED IMPROVEMENTS.—New 5,000,000-gall. pumping engine. SEWERS.—Has sanitary sewers, only, with purification by intermittent filtration. REFERENCES.—Eng. News., Feb. 10, '83; June 21, '90 (Salisbury Brook dam).

21. **BROOKFIELD,** Worcester Co. (3,352.) Built in '88-9 by town. First year or two used for fire purposes, only. SUPPLY.—Springs (or impounding reservoir, drainage area 70 acres ?), by gravity for about nine months of the year, pumping during the other three. PUMPS.—Cap., 300,000 galls. Knowles comp. dup. No coal used.; steam furnished to run pump at 35 cts. an hour. RESERVOIR.—Cap., 2,500,000 galls. DISTRIBUTION.—Mains, 2 miles; cost extension met by town appropriations. Taps, 75; made by town. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters: Town can compel the use of meters and any consumer may have one. Hydrants, public, 35. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $35,000. Debt was $16,000 at 4% in '90, at which time cost was reported as $17,000. MANAGEMENT.—Prest., Chas. L. Vizard; Rept. by Secy., Chas. A. Rice. SEWERS.—None.

22. **BROOKLINE,** Norfolk Co. (12,103.) Built in '75 by town. SUPPLY.—Driven wells (118 2½-in., in Jan. '95), and filtering galleries, pumping to reservoir and tank.

PUMPS.—Cap., 9,650,000 galls. Allis vert. triple, 5,000,000; 3 Worthington, 2,000,000 comp. cond., 1,500,000 non-comp. non-cond.; 1,000,000 comp. non-cond.; 1,500,000 Blake high service. American Coal Co.'s Jackson mine coal used; av. cost, $4.02 per short ton. FILTER GALLERIES.—722 ft., 4 ft. wide, vert., dry rubble masonry walls 2 ft. high, arched with brick, and 160 ft., 6 ft. wide, 6 ft. high in center, added in '78. RESERVOIRS.—Open, 6,050,000 galls. (not in use); Covered, 1,250,000 galls. Both reservoirs on Fisher's Hill. New covered reservoir built account of bad taste and odor due to algae growths in the ground water after exposure to light in old reservoir. See Eng. News, Dec. 21, '93, for illustrated description covered reservoir. TANK.—Cap., 450,000 galls.; 50 × 30 ft., for high service; covered. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION—Mains, 63.6 miles; cost extensions met by taxation. Taps, 2,775; made by town, free. Services, cem. lined iron; paid for by town. Meters: 1,223; owned, controlled and repaired by town. Use of meters: Town can compel the use of meters and any consumer may have one. Hydrants, public, 412. CONSUMPTION.—(Galls.) av., 1,325,942. PRESSURE.—Ordinary, 40-100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,259,945. Expenses, Operating, $17,992. Revenue, $58,135: Consumers, unmetered, $24,249; metered, $26,643; meter rentals, $2,243. MANAGEMENT.—Chn. of Water Bd., Wm. K. Melcher; Clk., Zeph. R. Forbes; Treas., Geo. H. Worthley; Supt., F. F. Forbes; Ch. Pump. Engr., Richard J. Flinn. Rept. by Supt., July 14. SEWERS.—Has sanitay and storm sewers. REFERENCES.—Eng. News, July 22, '82; Dec. 21, '93 (covered reservoir).

23. **CAMBRIDGE,** Middlesex Co. (70,028.) Owned by city since April 28, '65. First supplied in '37 by Cambridgeport Aqueduct Co. Corporation known as Cambridge Water-Works built plant in '55, which city bought in '65. SUPPLY.—Stony Brook in Weston, Waltham and Lincoln, the source of which is Sandy Pond, by gravity to Fresh Pond in Cambridge, thence pumping to stand-pipe and reservoir. Drainage area Stony Brook, 21 sq. miles; Fresh Pond, about 1 sq. mile. PUMPS.—Cap., 23,250,000 galls. "Worthington, with Blake ends;" two, 10,000,000 each, one 1,000,000 and one 2,250,000. Cumberland coal used; av. cost, $3.50 per short ton. FILTER GALLERY.—Not in use. See '90-1 Manual. RESERVOIRS.—Cap., 789,000,000 galls. Storage, Stony Brook Reservoir, Weston, 350,000,000; Fresh Pond Reservoir, Cambridge, 434,000,000. Distributing, 5,000,000; has surface about 80 ft. above mean low tide, and 35 ft. above Fresh Pond. STAND-PIPE.—To equalize pressure, 5.42 × 54 ft.; on granite foundation; enclosed in granite, brick and wood; overflow 130 ft. above mean low tide and 79 ft. above Fresh Pond. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 125 miles; cost extensions met by bonds. Taps, 12,681; made by city, actual cost charged to consumer. Services, galv. i.; paid for by consumer or owner. Meters: 346; owned, controlled and repaired by city. Use of meters optional with city; compulsory for manufacturers and boarding-houses. Hydrants, public, 859; private, 19. CONSUMPTION.—(Galls.) av., 6,002,142. PRESSURE.—Low service, 25 lbs.; high service, 50 lbs. Steam fire engines are used. FINANCIAL.—Cost, $4,022,682. Bonded debt, $2,215,500 at 3½, 4, 5 and 6%. Sinking Fund: $546,049. Revenue: Consumers, unmetered, $204,657; metered, $64,681. MANAGEMENT.—Prest., Jas. M. W. Hall; Clk., W. H. Harding, Cambridgeport; Treas., Wm. W. Dallinger; Acting Supt. and Ch. Pump. Engr., Edwin C. Brooks. Rept. by Act. Supt., June 6. PROJECTED IMPROVEMENTS.—Additional supply from Hobb's Brook, including storage basins of some 2,800,000,000 galls., 40,000,000-gall. Payson Park reservoir, and 40-in. steel force and supply main to and from latter reservoir. A 20,000,000-gall. vert. triple exp. pump, made by the Groshon High Duty Pumping Engine Co., New York, will probably be put in operation by middle '97. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, May 9, '78; July 2, '81; June 21, '90 (Stony Brook dam).

24. **CANTON,** Norfolk Co. (4,538.) Built in '88-9 by town. SUPPLY.—Two covered filter wells, 40 ft. in diam., 23 ft. and 27 ft. deep, respectively; 8,960 ft. apart, connected by a siphon. Bottom of one is 59 ft. higher than the other. PUMPS.—Cap., 2,000,000 galls. Knowles, Two 1,000,000 comp. cond. dup. STAND-PIPE.—Cap., 468,000 galls.; open, 35 × 65 ft., on solid masonry foundation resting on rock. Bottom of tank is in the form of an inverted cone. FISCAL YEAR CLOSED Jan. 31, '96. DISTRIBUTION.—Mains, 19.7 miles. Taps, 664. Meters (in '90), 15; press repts., July '96, stated Comrs. had decided to introduce meter system. Hydrants, 157. CONSUMPTION.—(Galls.) av., 182,372; max., 407,093. PRESSURE.—(In '89), 80 lbs. FINANCIAL.—Cost, $136,000. Bonded, $159,000, at 4%; due in payments of $4,000 to $7,000 annually. Expenses, $3,797. Revenue, $6,641; $11,000 appropriated by town to pay bonds falling due and int. MANAGEMENT.—Three Comrs. Chn., Michael F. Ward; Secy., Wm. R. Revere; Supt., Thos. E. Grover. REFERENCE.—Eng. News, Oct. 1, '96 (well sinking).

16. **CHELSEA,** Suffolk Co. (27,900.) Statistics included under Boston. REFERENCE.—Eng. News, Apr. 1, '82, for description of old works. NOTE.—See Metropolitan Water Supply, under Boston.

25. **CHESHIRE,** Berkshire Co. (1,308.) Built in '75 by Cheshire Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not fixed in franchise nor subject to regulations by city. SUPPLY.—Brooks, fed by mountain springs, by gravity from impounding reservoir. RESERVOIRS.—Cap., 900,000 galls.; 66x200 ft. x10 ft. deep; 200 to 280 ft. above village. DISTRIBUTION (in '90.)—Mains, 4

miles. Taps, 125. Hydrants, 17. PRESSURE.—Ordinary (in '89), 125 lbs. FINANCIAL.—(In '90). Cost, $17,000. Cap. Stock (May, '92): Common, authorized, $15,000; all paid-up, no debt, May, '92. MANAGEMENT.—(May, '96) Clk., Geo. Z. Dean; Treas., J. G. Northrup. REFERENCE.—Eng. News, Dec. 9, '82.

26. **CHESTER,** Hampden Co. (1,295.) Put in operation Jan. 1, '94, by Chester Fire District. Contr., C. L. Goodhue, Springfield, Mass. SUPPLY.—Austin Brook, by gravity from small impounding reservoir, about one mile from village. Drainage area, about 1¼ square miles. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by receipts. Services, galv. 1. Meters: 2; owned by district. District can compel the use of meters and any consumer can have one. Hydrants, public, 32; private, 1. FINANCIAL.—Cost, $20,000. Bonded debt, $18,000, at 3¾%; due $500 in 1898, $500 per yr. for 4 yrs., $1,000 per yr. till paid. Expenses, Operating, $50; int., $675. Revenue, Consumers, $880; City, fire protection, $300. MANAGEMENT.—Rept. by Secy., and Treas., J. C. Cooper, Sept. 5.

27. **CHICOPEE,** Hampden Co. (14,050.) Works now owned by city, plants supplying former Chicopee Central and Chicopee Falls fire districts, where joint public and private ownership prevailed, having come under full municipal ownership in '93, and franchise of Willimansett Water Co. having been bought in '92. At time of incorp. as city both fire districts owned mains and water was supplied by Cos., as noted in detail below.

CHICOPEE WATER CO. and CENTRAL FALLS FIRE DISTRICT.

First record of public water supply in town of Chicopee is in real estate deed of '44, indicating that a small domestic plant was in existence. In '48 Central Falls fire district was organized and contracted with owners of plant, Bemis & McClannan, for water for fire reservoirs and engine houses. In '67 district began laying cast iron mains and setting hydrants, water being furnished for fire protection, only, first by Ames Mfg. Co., and later by Dwight Mfg. Co., also. In '77, Chicopee Water Co. was organized, buying out owner of private plant for $36,400. Co. apparently supplied water for domestic purposes, only, until '86, when fire district contracted with it to furnish water for fire purposes for $1,500 per yr., giving Co. right to supply water for domestic purposes from same mains. The district never furnished water for domestic use. In '93, Co. was bought out by city.

CHICOPEE FALLS FIRE DISTRICT.

Organized in '48 for fire protection. First supplied water for domestic use in '81, contracting with Chicopee Mfg. Co. to furnish water for fire purposes for $365 per yr., and for domestic purposes for one-half the receipts from private consumers. This contract remained in force during existence of district.

WILLIMANSETT WATER CO.

Organized in '92 and obtained franchise to supply village of Willimansett, within city of Chicopee. Later in year city bought franchise and works.

PRESENT WORKS.

Formed by consolidation and purchase, as noted above, and enlargement. City paid $116,000 for plant of Chicopee Water Co., and $9,562 for that of Willimansett Water Co. In '93, city introduced new supply. Engr., E. C. Davis, Northampton. Contrs., Latham & Taylor, Northampton. SUPPLY.—Dingle, Powderhorn, Cooley and Morton Brooks, by gravity and pumping to reservoirs and stand-pipes. PUMPS.—Cap., 4,500,000 galls.; Holly-Gaskill hor. high duty, 2,500,000, Deane dup. comp. cond., 2,000,000. Force main, 16-in. New River bituminous coal used. RESERVOIRS.—Impounding: Cooley and Morton brooks. Settling: Cap., about 500,000 galls.; 71 × 107 ft., 7 ft. deep; at head of supply main, below impounding reservoirs. Storage and distributing: Dingle Brook or Abbe, 5,000,000; Willimansett or Powderhorn. STAND-PIPES.—Cap., 1,210,000 galls.; 55 × 60 ft., 1,000,000; 30 × 40 ft., 210,000. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 33 miles; cost extensions met by issue of bonds, amounting in '95 to $45,000. Taps made and services laid by city to curb for $10. Services lead; paid for by consumer from curb. Meters, 100; owned, controlled and repaired by city; yearly rental, 10% of cost; use of meters optional with city; compulsory for hotels and saloons. Hydrants, public, 144; private, 83. CONSUMPTION.—(Galls.) av., 1,100,000 est. PRESSURE.—Ordinary, 30 lbs.; fire, 105 lbs.; one steam fire engine for use at high elevations. FINANCIAL.—Cost, $345,722. Bonded debt, $280,000 at 4%; due yearly, paid by direct tax. Expenses: Operating, $7,753; int., $11,420. Revenue, $28,542. Principal of bonds payable yearly in amounts of $10,000 by tax. Balance above expenses at end of fiscal year are put in city treasury. MANAGEMENT.—Chn., Patrick Rourke: City Treas., John D. White. Rept. by Supt., C. A. Bullens, June 5. PROJECTED IMPROVEMENTS.—Five miles of extensions and 30 new hydrants. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 4, '82; May 17, '84 (old Chicopee Falls plant).

27. **CHICOPEE FALLS,** Hampden Co. See Chicopee.

28. **CLINTON,** Worcester Co. (10,424.) Built in '82 by town. Sells water to Lancaster. SUPPLY.—Spring basin, Upper and Lower Lynds, Fitch and Heywood Ponds, by gravity. RESERVOIRS.—Cap., about 88,000,000 galls. Storage: Spring basin, 6,648,000; Upper Lynds, 14,300,000; Lower Lynds, 8,729,000; Fitch Pond, 30,353,000, and Heywoods Pond, 25,216,000; Burditt Hill Distributing: (in '89) 2,500,000 galls. Conduit to

distributing reservoir (in '89) 6 miles 16-in. c. i. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 29¾ miles; cost extensions met by bonds. Taps, 1,482; made by town. Services, cem. lined w. i.; paid for by consumer. Meters: 250; owned, controlled and repaired by town; yearly rental, $1.50 and upwards; town can compel use of meters and any consumer may have one. Hydrants, public, 159; private, 74. CONSUMPTION.—(Galls.) av., 1,600,000. PRESSURE.—Ordinary, 20 lbs.; fire, 115 lbs. Steam fire engines are used. FINANCIAL.—Debt, $325,000 at 4%, all bonded: $125,000 due 1911, $100,000 due 1912, $50,000 due 1914, $50,000 due 1921. Sinking Fund: $63,300.56, invested in water bonds to extent of $50,000, balance in savings bank at 4% interest. MANAGEMENT.—Chn., H. H. Lowe; Secy., G. S. Gibson; Treas., J. H. Harrity; Supt., O. B. Bates; Rept. by A. S. Fuller, Regst., July 22. PROJECTED IMPROVEMENTS.—Increase of supply rept. on in '96 by Engr., C. A. Allen, Worcester. REFERENCE.—Eng. News, Feb. 10, '88.

29. **COCHITUATE,** Middlesex Co. (Town of Wayland, 2,060.) Built in '78 by town of Wayland, of which Cochituate is principal village. SUPPLY.—Snake River, by gravity from impounding reservoir, with direct pumping for fire protection. Drainage area, ⅝ sq. mile. Filter gallery, 560 ft. long, 1 ft. wide, 1½ ft. high, covered with from 4 to 10 ft. of earth was built near and part of it beneath reservoir; not stated whether still in use. PUMPS.—Amoskeag rotary, driven by 30-in. turbine of 40 HP. RESERVOIRS.—Cap., 16,000,000 galls.; area, 13 acres; 68 ft. above village. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 6 miles. Taps, 230. Meters, 0. Hydrants, 33. PRESSURE.—(In '89) Ordinary, 30 lbs.; fire, 88 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $30,000; $25,000 at 5%, $5,000 at 4%. Sinking Fund: $8,000, invested at 4%. Expenses: Operating, $250; int., $1,450. Revenue: Consumers, $2,600; City, $584. MANAGEMENT.—Address Water Board. NOTE.—No report since '90-91 Manual. REFERENCE.—Eng. News, Jan. 20, '83.

30. **COHASSET,** Norfolk Co. (2,448.) Built in '86 by Cohasset Water Co. SUPPLY.—Sixty-five 2-in. driven wells, pumping to reservoir. PUMPS.—Cap., 750,000 galls.; Blake comp. RESERVOIRS.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Aug. 1. DISTRIBUTION.—Mains, 7 miles. Taps, 286. Meters, 0. Hydrants, public, 36. PRESSURE.—Ordinary (in '89), 60 lbs. FINANCIAL.—Cost, $80,000. Debt, $37,500: Floating, $7,500; Bonded, $30,000. Revenue, city, $1,800. MANAGEMENT.—Prest., C. A. Welsh, Boston; Secy., Caleb Lothrop; Treas., W. S. Bryant; Supt., D. N. Tower. Rept., Oct. 14.

31. **CONCORD,** Middlesex Co. (4,427.) Built in '74 by town. SUPPLY.—Sandy Pond, by gravity. Area of pond, 152 acres; drainage area, 178 acres, excluding pond surface; drawn upon by Lincoln, also. RESERVOIRS.—Cap., 2,500,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 27 miles; cost extensions met by bonds, Taps, 780; made by town to street line. Services, lead; paid for by consumer from street line. Meters, 10; owned, controlled and repaired by town. Use of meters optional with town; compulsory for railways, prison and factories. Hydrants, public, 130; private, 1. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 44 lbs. FINANCIAL.—Cost, $164,066. Expenses: Operating, $1,355; int., $3,458. Revenue, Consumers, unmetered, $9,046; metered, $4,693; City, fire protection, $1,300. Deficits are met by taxation for hydrant service only. MANAGEMENT.—Comrs., Chn., Samuel Hoar; Secy. and Treas., John C. Friend; Rept. by Supt., John O. Haskell, June 8. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Oct. 29, '81.

32. **COTTAGE CITY,** Dukes Co. (1,080.) Built in '90 by Cottage City Water Co. Fire protection system built in '84 by fire district. FRANCHISE.—Perpetual, provides for purchase of works by town, at any time, price to be determined by arbitration or by three appraisers appointed by court. Rates are fixed in franchise and subject to regulation by city. SUPPLY.—Springs, pumping to stand-pipe. Springs are at the head of Lagoon Pond. Water collected by 12-in. vitrified drain pipe, laid with open joints, 525 ft. long, and 6-in. branches, 260 ft. long. PUMPS.—Cap., 2,000,000 galls. Deane comp. dup., 1,250,000, Knowles high pressure, 750,000. STAND-PIPE.—Cap., 166,000 galls.; iron; 20×70 ft. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 12.8 miles. Taps, 488; made by Co. to street line for $2. Services, galv. i.; paid for by consumer from street line. Meters: 2; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical purposes. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 60,548; max., 168,400; min., 18,000. PRESSURE.—Ordinary (in '89), 70 lbs. Steam fire engines are used. FINANCIAL.—Cost, $144,840. Cap. Stock, paid-up, $80,000. Bonded debt, $62,000, at 5%. Sinking fund, invested in bonds of Co. MANAGEMENT.—Prest., Lucius H. Fuller, Putnam, Conn.; Secy., J. F. J. Mulhall, 89 State St., Boston, Mass.; Supervising Engr. and Treas., William Wheeler, 89 State St., Boston, Mass.; Supt., Hamilton J. Greene; Ch. Pump. Engr., Geo. A. Smith. Rept. by Super. Engr., Oct. 5. SEWERS.—None. REFERENCE.—Eng. News, Apr. 18, '85.

33. **DALTON,** Berkshire Co. (2,885.) Built in '84 by fire district. SUPPLY.—Egypt Brook, by gravity from two reservoirs. RESERVOIRS.—Cap., 31,250,000 galls.: Old, 3,250,000; New, 28,000,000, built in '94. DISTRIBUTION.—Mains, 12 miles. Taps, 498. Hydrants, 69. FINANCIAL.—Cost, $57,000. Bonded debt, $50,000, at 4%, due 1914. Expenses: Operating, $628; int., $2,000. Revenue, $4,544. MANAGEMENT.—Three Comrs. NOTE.—No report since '90-1 Manual.

34. **DANVERS,** Essex Co. (7,454, Danvers town.) Present works built in '76 by town. Supplies villages of Tapleyville, Danvers Centre and Danversport, in town of Danvers and Middleton on pipe line. In 1799 Salem and Danvers Aqueduct Co. built works, which supplied Salem and Peabody, and presumably Danvers, also. SUPPLY.—Middleton Pond, pumping to reservoir. Pond is 5 miles distant, 30 ft. above the sea; area, 90 acres; drainage area, 3 sq. miles. In previous repts. Swan Pond has been given as additional source; area, 69 acres; drainage area, about 200 acres. PUMPS.—Cap., 4,000,000 galls. 2—2,000,000 Worthington comp. cond. Force main, 12-in., 13,879 ft. long. Cumberland coal used; av. cost, $4.20 per short ton. RESERVOIRS.—Cap., 6,500,000 galls. Distributing. Wells Hill, in Middleton, 1,500,000; also Danvers Asylum, 5,000,000; 230 ft. above sea level. Latter reservoir built by State. FISCAL YEAR CLOSED Feb. 1, '95. DISTRIBUTION.—Mains, 42 miles; cost extension met by notes or bonds. Taps, 1,523. Services, cem. lined w. i.; paid for by town to street line. Meters: 50; owned and controlled by town. Use of meters optional with town; compulsory for manufacturers. Hydrants, public, 225. CONSUMPTION.—(Galls.) av., 601,000; max., 803,000; min., 520,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $270,500. Debt, $253,170: Floating, $33,170; Bonded, $180,000 at 5%, $40,000 at 4%. Sinking fund, $74,083, invested in municipal and railway securities, except some $2,000. Expenses, $18,598: Operating, $6,671; int., $11,927. Paid to sinking fund, $6,086. Revenue, $24,682: Consumers, $24,457; misc., $126; City, fire protection and public buildings, $4,000. MANAGEMENT.—Prest., Geo. W. Fish; Secy., Otis F. Putnam; Treas., Edwin Turner, Jr. Rept. by Julius Peale, Reg., Oct., '96. SEWERS.—None. REFERENCE.—Eng. News, Apr. 15, '82.

34. **DANVERS CENTRE,** Essex Co. See Danvers.

34. **DANVERSPORT,** Essex Co. See Danvers.

35. **DEDHAM,** Norfolk Co. (7,123.) Built in '81 by Dedham Water Co. Contract for hydrant service expired fall of '96; not stated whether it has been renewed. Town appointed committee in '95 to consider purchase of works. SUPPLY.—Well, pumping to stand-pipe. Well 40 ft. from river, 26 × 18 ft., roofed and ventilated. Direct connection between river and one of the pumps for emergency use. PUMPS.—Cap., 2,050,000 galls. Blake comp. dup., 1,250,000; Knowles single comp., 800,000. STAND-PIPES.—Cap., 775,000 galls.; one about 525,000; 42 × 51 ft., iron, open top; 52 ft. above foundation of the other, which is 20 × 100 ft., cap., 250,000 galls., not covered. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 21.7 miles. Taps, 1,040; made by Co. for $5. Meters, 25; owned by Co.; yearly rental, 10% of cost. Hydrants, public, 135. CONSUMPTION.—(Galls.) av., 410,763; max., 841,652; min., 242,480. PRESSURE.—Ordinary, 50 to 72 lbs. FINANCIAL.—Cost, $216,164. Cap. Stock, paid-up, $125,000; Paid 4% div'd in '95; Bonded debt, $100,000 at 5%. Expenses, $13,584: Operating, $6,832; int., $5,462: taxes, $1,290. Revenue: Consumers, $21,110. MANAGEMENT.—Prest., W. Warren; Clerk, Alfred Hewins; Treas., Jno. R. Bullard; Supt., Geo. T. Staples. REFERENCES.—Eng. News, July 14, '83.

P 11. **DEERFIELD,** Franklin Co. (2,910.) See South Deerfield.

9. **DODGEVILLE,** Bristol Co. Supply from Attleborough.

19. **EAST BRIDGEWATER,** Plymouth Co.. See Bridgewater.

36. **EASTHAMPTON,** Hampshire Co. (4,395.) Built in '73 by town. Easthampton Aqueduct Co. dissolved by legislature in '93; no further information. SUPPLY.—Small impounding reservoir on Bassett Brook, by gravity to pumping station, thence pumped to reservoir. Drainage area, 6.9 sq. miles. A 12-in. c. i. pipe leads to basin and a 10-in. force main is used. PUMPS.—One run by 75-HP. water wheel; one steam, 50-HP. boiler. RESERVOIR.—Cap., 600,000 galls.; distributing, on side of Mt. Tom; 185 ft. above center of town. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 7 miles. Hydrants, public, 90. PRESSURE.—(In '89) Ordinary, 75 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $50,000. Notes, $37,000 at 4 and 4½%, payable $3,500 per yr. Expenses: Operating, $1,200; int., $1,550. Revenue, $4,500. MANAGEMENT.—Comrs., Chas. W. Smith, E. Thos. Sawyer and Chas. H. Upsom; Town Clerk and Treas., Joseph W. Wilson. Rept. by Town Clk., Sept. 26.

16. **EVERETT,** Middlesex Co. (11,068.) Supply from Mystic system, Boston. Supply introduced in '91. NOTE.—See Metropolitan Water Supply, under Boston.

37. **FAIRHAVEN,** Bristol Co. (2,919.) Built in '94 by Fairhaven Water Co. Engr., M. M. Tidd. FRANCHISE.—Perpetual. Provides for purchase of works by town within 20 yrs. Rates are not fixed in franchise nor subject to regulation by town. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Driven wells, pumping to stand-pipe. Wells on both sides and in bed of Nasketucket River, a shallow stream; in '94 there were 26, each 2½ ins. diam., about 35 ft. deep, in area about 130 × 350 ft. PUMPS.—Cap., 3,000,000 galls. Snow comp., 1,500,000 each. Buckwheat coal used. TANK.—Cap., 400,000 galls., steel; 35 × 50 ft., on 100 ft. steel trestle with galv. i. conical roof. DISTRIBUTION.—Taps, 350; made by Co.; no charge. Services, lead and iron; paid for by consumer. Meters: 45; owned by consumer. Use of meters: Co. can compel use of meters and any consumer may have one. Hydrants, public, 80; private, 2. CONSUMPTION.—(Galls.) av., 150,000; max., 200,000; min., 100,000. PRESSURE.—Ordinary and fire, 80 lbs. FINALCIAL.—Cost, $130,000. Cap. Stock, authorized, $100,000;

all paid-up. Floating debt, $30,000. Revenue: City, fire protection, $2,000. MANAGEMENT.—Prest. and Supt., Jos. K. Nye; Treas., W. P. Winsor; Ch. Pump. Engr., Oscar Anderson. Rept. by Prest., June 11. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Sept. 5, '95, illus.

38. **FALL RIVER,** Bristol Co. (74,398.) Built in '71-4 by city. SUPPLY.—Watuppa Lake, pumping through mains to stand-pipes and tanks. Lake has area 3,478 acres, 128 ft. above tide-water; drainage area, 31.25 sq. miles; cap., 10,000,000,000 galls. PUMPS.—Cap., 18,000,000 galls., Worthington comp. cond., 5,000,000, Davidson, 5,000,000 galls. and 8,000,000; Borden Mining Co.'s Cumberland coal used; av. cost, $3.19 per short ton. STAND-PIPES AND TANKS.—Cap., about 2,550,000 galls. Two stand-pipes 42 in. in diam. and 60 and 80 ft. high, respectively, enclosed in masonry towers. Two tanks, one, cap., 1,160,000; 73 × 37 ft., 305 ft. above tide; one 1,390,000, 65 × 56 ft., iron, 11-16 in. plates at bottom, 5-16 in. at top, reinforced with angle iron at top. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 76 miles; cost extensions met by taxation or bonds. Taps, 6,372; made and service laid to street line by city, free. Services, lead; paid for by consumer from street line. Meters, 5,212; owned by consumer; controlled and repaired by city. Use of meters compulsory for all consumers except for domestic and building purposes. City can compel the use of meters and any consumer may have one. Hydrants, public, 780. CONSUMPTION.—(Galls.) av., 3,166,509. PRESSURE.—Ordinary and fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $2,281,446, including operating expenses. Bonded debt, $1,875,000. Sinking Fund: $409,869 at 4.9% (av.). Expenses: Operating, $37,604; int., $100,705. Revenue: Consumers, unmetered, $7,282 (including $326 fines); metered, $110,175; City, $35,000. MANAGEMENT.—Prest., Jos. Walters; Water Reg., W. W. Robertson; Supt., Patrick Kieran; Ch. Pump. Engr., P. H. Olys. Rept. by Reg., Sept. 30. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, June 6, 13, July 4, 11, 18, Aug. 1, '78; July 2, '81; Aug. 21, '86 (chimney of engine house struck by lightning); Apr. 6, '93 (tank).

D 3. **FALMOUTH HEIGHTS,** Barnstable Co. (2,567.) Built in '93 by Falmouth Heights Water Co.; put in operation in July. Supply, well, 5 ft. in diam., 20 ft. deep, pumping to tank. Pump, cap., 24,000 galls.; driven by hot air engine. Franklin and chestnut coals used; av. cost., $8 and $7 per short ton, respectively. Tank, cap., 25,000 galls.; cypress, 13½ × 18 ft., 90 ft. above sea level; on tower 25 ft. high. Mains, 1 mile. Taps, 35; made by consumer; no fee. Services, ¾-in. galv. i.; paid for by property owner on his own land. Meters, 0. CONSUMPTION.—(Galls.) av., 5,000; max., 10,000; min., 1,000. Cost, $4,500. Cap. Stock, authorized, $4,000; div'd, $185. Expenses: Operating, $110; taxes, $44. Revenue, $407. Prest., Wm. P. Brooks, Amherst; Secy., Treas. and Supt., H. K. Craig; Ch. Pump. Engr., Wheelock T. Craig. Rept. by Ch. Pump. Engr., Dec. 29. Has private system of sanitary sewers.

39. **FITCHBURG,** Worcester Co. (22,037.) Built in '71-2 by city. Rept. Mass. Gas and Electric Light Comrs., '93, p. 73, states that Fitchburg Gas Co. furnishes water, but quantity must be small. SUPPLY.—Storage reservoirs and pond, by gravity. RESERVOIRS.—Cap., 761,000,000 galls. Storage: Scott reservoir, 200,000,000; area, 35 acres; Meeting House Pond, Westminster, 500,000,000. Distributing: Overlook high service, 60,000,000, 400 ft. above city, and Marshall low service, 1,000,000, 200 ft. above city. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 59⅛ miles; cost extensions met by receipts. Taps, 3,876; made by city. Services, iron; paid for by consumer to street line. Meters, 1,778: owned by city, 126; consumers, 1,652; controlled and repaired by city. Use of meters compulsory for hotels, stables and manufacturing purposes. City can compel the use of meters and any consumer may have one. Hydrants, public, 344; private, 64. CONSUMPTION.—(Galls.) av., 2,500,000; max., 3,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $836,000. Sinking Fund, $152,437, invested in bonds at 5%. Expenses: Operating, $18,298; taxes, $650. Revenue: Consumers, unmetered, $27,248; metered, $33,267. City pays interest on bonds from general tax levy. MANAGEMENT.—Prest., Samuel D. Sheldon; Secy. and Supt., Thos. C. Lovell. Rept. by Supt., June 9. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 4, '82.

96. **FLORENCE,** Hampshire Co. Supply from Northampton.

40. **FOXBOROUGH,** Norfolk Co. (2,933.) Built in '91 by Water Supply District; put in operation Dec. 22. Engr., Frank L. Fuller, Boston. Contr., Nahum Perry, Attleboro. SUPPLY.—Driven wells, pumping to stand-pipe. As constructed, there were 24 2-in. driven wells, 24 × 54 ft. deep, av., 31 ft. PUMPS.—Cap., 720,000 galls. Blake. Bituminous coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 282,000 galls.; 20 × 120 ft., of ⅝ to ¼-in. iron plates, with galv. i. conical-shaped roof. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 12 miles; cost extensions met by loans. Taps, 371; made by district; free. Services, iron, cem.-lined; paid for by district to property line. Meters, 125; owned and repaired by consumer; controlled by district. Use of meters compulsory for large consumers. District can compel use of meters and any consumer may have one. Hydrants, public, 90; private, 6. CONSUMPTION.—(Galls.) av., 141,030; max., 171,068; min., 127,436. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost (to close of '92), $73,605. Bonded debt, $85,000. Expenses: Operating, $1,500. Revenue: Consumers, $5,000; City, fire protection, $2,000. Deficits, none; receipts so far have met all expenses. MANAGEMENT.—Prest., E. P. Carpenter; Secy.,

Geo. F. Williams; Treas., Wm. B. Crocker; Ch. Pump. Engr., F. B. Greene. Rept. by Geo. F. Williams, June 17. PROJECTED IMPROVEMENTS.—New pumps and boilers of 1,500,000 galls. daily cap. SEWERS.—None.

121. **FRAMINGHAM,** Middlesex Co. (9,239, town.) See South Framingham.

41. **FRANKLIN,** Norfolk Co. (4,831.) Built in '84 by Franklin Water Co. FRANCHISE.—25 yrs. from '84; provides for purchase of works by city at any time. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Two wells on bank of Mine Brook, pumping to stand-pipe. One well is 20 × 25 ft.; other 33 × 18 ft. PUMPS.—Cap., 1,000,000 galls. Knowles comp. dup. cond. Bituminous coal used. STAND-PIPE.—Cap., 423,000 galls.; steel, 30 × 80 ft. DISTRIBUTION.—Mains, 9 miles; cost extensions met by receipts. Taps, 580. Services, lead and iron; paid for by consumers. Meters, 10; owned, controlled and repaired by Co. Use of meters optional with consumer; except compulsory for manufacturers. Hydrants, public, 79. CONSUMPTION.—(Galls.) av., 780,000. PRESSURE.—Ordinary, 34 lbs.; fire, 99 lbs. FINANCIAL.—Cost, $151,000. MANAGEMENT.—Prest., J. G. Ray; Secy., Geo. W. Wiggin; Treas., Geo. H. Norman, Jr.; Supt., W. E. Nason; Ch. Pump. Engr., S. C. Baily. Rept. by Supt., June 6. SEWERS.—None. REFERENCES.—Eng. News, Jan. 31, '85; Nov. 5, '87; Oct. 6, '88; March 16, '93; April 19, '94 (stand-pipe failure).

42. **GARDNER,** Worcester Co. (8,424.) Built in '82 by Gardner Water Co. FRANCHISE.—Provides for purchase of works by city in 1902. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Crystal Lake, pumping to reservoir. Lake has area of 156 acres, drainage area, excluding water surface, 414 acres; depth, 40 ft.; no shallow flowage. PUMPS.—Cap., 4,000,000 galls.; two Deane steam comp. cond., 2,500,000 and 1,500,000, respectively. Bituminous coal used. RESERVOIR.—Cap., 5,000,000 galls.; about 180 ft. above pumps and from 100 to 250 ft. above town. DISTRIBUTION.—Mains (in '90), 15½ miles. Taps, 1,050. Services, cem. lined w. i. Meters (in '90), 32. Use of meters compulsory for large consumers. Hydrants, public, 96. CONSUMPTION.—(Galls.) av., 650,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—(In '90) cost, $151,144. Cap. Stock (May, '92), authorized, $100,000; all paid-up. Debt (May, '92), $60,550. MANAGEMENT.—Prest., C. H. Green; Treas. and Supt., H. W. Conant; Ch. Pump. Engr., M. Kersey. Rept. by Supt. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, May 10, '84.

43. **GLOUCESTER,** Essex Co. (24,651.) Purchased by city Oct. 1, '95. Built in '85 by Gloucester Water Supply Co. Rept. Mass. Gas and Electric Light Comrs. for '93, p. 73, says Gloucester Gas Light & Water Co. then supplied water. SUPPLY.—Dykes Meadow and Wallace Ponds, on same stream, pumping to reservoir. Dykes' Meadow Pond was formed by flooding extensive meadow; area, 88 acres; av. depth, 18 ft.; drainage area, 408 acres; 92 ft. above sea. Wallace Pond has drainage area of 178 acres; 61 ft. above sea. PUMPS.—Cap., 5,000,000 galls. Knowles. Bituminous coal used. RESERVOIR.—Cap., 6,000,000 galls. DISTRIBUTION.—Mains, 30 miles. Taps, 2,300; made by city. Services, cem. lined and w. i.; paid for by city to street line, consumer balance of distance. Meters, 40; owned and repaired by consumer; controlled by city. Use of meters optional with city; compulsory for wharves and factories. Hydrants, public, 182. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $560,310. MANAGEMENT.—Clk., F. F. Wonson; Treas., Sylvanus Smith; Supt., J. W. Moran; Ch. Pump. Engr., C. H. Marsh, West Gloucester. SEWERS.—Has storm sewers only.

44. **GRAFTON AND NORTH GRAFTON,** Worcester Co. (Town of Grafton, 5,002.) Owned by Grafton Water Co.; built in '86-7 by National Water-Works Syndicate, Boston. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city, price, in '96, $93,000, $1,500 added annually. Rates are not fixed in franchise nor subject to regulations by city. Co. is not exempt from local taxes. SUPPLY.—Springs, collected in gallery, also driven wells, pumping to stand-pipe. Gallery (in '90), 12 × 95 ft., 17-ft. walls, with bottom 20 ft. below surface. In '89 wells were sunk. PUMPS.—Cap., 1,750,000 galls.; two 500,000 Worthington non-cond., one comp., one non-comp.; also 750,000, make not given. Bituminous coal used. STAND-PIPE.—Cap., 110,000 galls.; iron, 25 × 30 ft.; no roof. FISCAL YEAR CLOSED June 10. DISTRIBUTION.—Mains, 10 miles. Taps, 290. Services, galv. i.; paid for by owners and consumers. Hydrants, public, 93; private, 2. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—(In '90) Cost, $81,314. Cap. Stock, authorized, $80,000; all paid-up. Debt, $81,314. Floating, $1,314. Bonded, $80,000; $65,000 at 5%; $15,000 at 6%. Expenses: Operating, $2,500; int., $4,150; taxes, $100. Revenue, $2,500. MANAGEMENT.—Prest., C. W. McLellan; Secy., Walter Ames; Treas. and Supt., Solon F. Smith. Rept. by Supt., June 6.

45. **GREAT BARRINGTON,** Berkshire Co. (4,612.) In '90 city bought works of Great Barrington Water Co. and Berkshire Heights Water Co., built in '67 and '86-9, respectively. Works at that time were as follows: SUPPLY.—Mountain stream, by gravity from reservoir and by pumping for first-named plant and Green River, pumping to reservoir for latter. PUMPS.—A 250,000-gall. Deane triple power, and other or others not given. RESERVOIRS.—Impounding, cap. not given; distributing, 1,000,000. DISTRIBUTION.—Mains (G. B. W. Co.), 4½ miles. Hydrants (G. B. W. Co.), 29. FINANCIAL.—

Purchase price: (B. H. W. Co.), $40,819 Cap. Stock, G. B. W. Co., $28,000; B. H. W. Co., $20,000. Latter Co. also had debt of $13,000. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Oct. 29, '81.

46. **GREENFIELD,** Franklin Co. (5,252.) Built in '70 by fire district. SUPPLY.—Glen Brook, by gravity from impounding reservoir and by pumping from Green River, as reserve. Drainage area of brook, est., 5.35 sq. miles of mountainous country. PUMP.—Cap., 1,250,000 galls.; Deane dup. RESERVOIR.—Cap., 17,800,000 galls.; area, 5¼ acres; max. depth, 32 ft., with about one acre of shallow flowage (in '90); 5 miles from, 230 ft. above village. DISTRIBUTION.—(In '90.) Mains, 22 miles. Taps, 1,000. Meters (in '88), 6. Hydrants, 71. FINANCIAL.—(In '90.) Cost, $161,227. Expenses: Operating, $989 (not including salaries?). Revenue, Consumers, $12,986. MANAGEMENT.—Comrs., Chas. J. Day, Chn.; E. A. Newcomb, A. A. Rankin. REFERENCE.—Eng. News, Feb. 4, '82.

P 3. **GROTON,** Middlesex Co. (2,057.) Proposed to incorp. Co. early in '97. Probable supply, springs, pumping to reservoir, 220 ft. above town. Engr., C. A. Allen, Worcester. Est. cost, $50,000. Chn. Com., Dr. J. Park. Repts. in Dec., '96.

47. **HATFIELD,** Hampshire Co. (1,246.) Built in '96 by town; put in operation Aug. 6. Engrs., E. C. & E. E. Davis, Northampton. Contrs., Westchester Public Works Co. SUPPLY.—Running Gutter Brook, fed by springs, by gravity. There is a small reservoir. DISTRIBUTION.—Mains, 0 miles. Taps, 100; made by town. Services paid for by consumer. Hydrants, public, 34. PRESSURE.—Ordinary, 43 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $30,000, at 4%. Sinking Fund, $565, invested at 4¼%. Deficits met by general taxation. MANAGEMENT.—Chn., I. B. Lowell; Secy., E. B. Dickenson; Treas., D. W. Wills. Rept. by I. B. Lowell, Sept. 10.

48. **HAVERHILL,** Essex Co. (27,412.) Now owned by city. Built in '03 by Haverhill Aqueduct Co.; city bought works in '91, taking possession July 6. Additional supply introduced in '95; Engr., Freeman C. Coffin, 53 State St., Boston. SUPPLY.—Four ponds, by gravity, with pumping for high service; also impounding reservoir, water from which is pumped to Kenoza Lake. Combined area of ponds 462 acres; do., drainage area, 3,207 acres, both est.; Lake Pentucket (Round Pond), area, 40 acres; drainage area, 273 acres; Lake Saltonstall (Plug Pond), area, 38 acres; drainage area, 221 acres; Kenoza Lake, area, 232 acres; drainage area, 794 acres; Crystal Lake, area, 152 acres; drainage area, 1,919 acres. Drainage areas given include water surfaces. In addition to above 7.75 sq. miles drainage area of East Meadow River was made available in '95 by building impounding reservoir on East Meadow River. PUMPS.—Cap., 11,000,000 galls.; three Worthington; 2—1,500,000 comp. cond. low duty, 8,000,000 triple exp. high duty, contracted for in '96. Anthracite coal used. RESERVOIR.—Cap., about 125,000,000 galls.; area, 50 acres; max. depth, 15 ft.; av. depth, 7 ft. Force main to Kenoza Lake, 24 in., one mile long. High water in reservoir is 18 ft. below high water in lake. STAND-PIPES.—Cap., 777,500 galls.; 2 iron, 30 × 40 ft., 211,500 galls., 256 ft. above river; 40 × 60 ft., 566,000 galls. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 51¼ miles; cost extensions met by income. Taps, 4,040; made by city at consumer's expense. Services, lead; paid for by consumer. Meters, 281; owned and controlled by city; yearly rental, 10% of cost. Use of meters compulsory for factories, hotels and livery stables. City can compel the use of meters and any consumer may have one. Hydrants, public, 223. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 45 lbs.; fire, 95 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,005,858, of which $680,424 was paid to Co. for plant and $22,181 for legal advice in connection with purchase. Bonded debt, $460,000, at 4%, due 1922; $300,000 at 4%, due 1912. Sinking Fund, $49,025. Expenses: Operating, $17,,393; int., $29,200; paid to Sinking Fund, $14,000. Revenue: Consumers, unmetered, $76,116; metered, $12,815; City, fire protection, $0; street sprinkling, $1,754; $220 for water used in making macadam roads; public buildings, $2,606. MANAGEMENT.—Prest., Augustine M. Allen; Secy. and Treas., Jas. A. Huntington; Supt., Henry W. Rogers; Ch. Pump. Engr., A. L. Klingeman. Rept. by water-works, June, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Feb. 10, '83; May 18, '93 (meters); Aug. 31, '93 (history of Co.).

9. **HEBRONVILLE,** Bristol Co. Supply from Attleborough.

49. **HINGHAM AND HULL,** Plymouth Co. (Hingham, 4,564; Hull, 989.) Built in '79-80 by Hingham Water Co., and extended to Hull in '82. FRANCHISE.—Provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay $2,250 for public service. SUPPLY.—Accord and Fuilling Mill ponds, by gravity and pumping to stand-pipe from receiving basin, 50 × 120 ft., 10 ft. deep. Accord Pond has cap. of 200,000,000 galls., area of 98 acres, drainage area of 365 acres and is 135 above tide level. Fuilling Mill Pond has area of 14 acres and is 30 ft. above tide level; its av. depth is 6 ft., and it has a muddy bottom. PUMPS.—Cap., 2,500,000 galls.; two Deane, 1,000,000 and 1,500,000 dup. comp. cond. Cumberland coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 400,000 galls.; iron, covered; 40 × 43 ft., on ground 90 ft. above tide-level. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 50½ miles. Taps, 1,742; made by Co. for $3. Services, w. l. and galv. l.; paid for by consumer. Meters: 3; owned and controlled by Co. Use of meters compulsory for manufacturers. Hydrants, public, 204; private, 10. PRESSURE.—Ordinary, 52 lbs. FINANCIAL.—(In '90.) Cost, $265,610. Cap. Stock, authorized, $120,000; all paid-up; paid 6%

div'd in '90. Debt, $127,000: Floating, $7,000; Bonded, $120,000 at 6%. MANAGEMENT.—Prest., E. L. Ripley; Secy. and Treas., Starkes Whiton; Supt., Wm. H. Thomas; Ch. Pump. Engr., Clarence G. Trussell, North Weymouth. Rept. by Supt., June 6. REFERENCE.—Eng. News, Feb. 18, '82.

50. **HINSDALE,** Berkshire Co. (1,739.) Built in '89 by fire district. SUPPLY.—Brooks and springs, by gravity from impounding reservoir. RESERVOIRS.—Cap., 34,000,000 galls.; area, 9 acres; max. depth, 21 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4 miles. Taps, 200; made by fire district to within 10 ft. of property line. Meters (in '90), 0. Fire district can compel the use of meters and any consumer may have one. Hydrants, public, 46; private, 2. PRESSURE.—Ordinary, 118 lbs. FINANCIAL.—Cost, $36,000; Bonded, $30,000, at 4%, due 1921. Expenses: Int., $1,200. Revenue: Consumers, $1,753; City, fire protection, $200. Payment of $1,000 a year on principal met by taxation. MANAGEMENT.—Three comrs. Chn., G. T. Plunkett. Rept. by Chn., June 5. SEWERS.—None.

51. **HOLBROOK,** Norfolk Co. (2,474.) Built in '87-8 by town. SUPPLY.—Lake in Randolph and Braintree, pumping to stand-pipes. Pumping station owned and operated jointly by Holbrook and Randolph. PUMPS.—Cap., 4,000,000 galls.; Holly hor. dup., 2,500,000; Blake dup., 1,500,000. Cumberland coal used; av. cost, $5 per short ton. STAND-PIPES.—Holbrook: Cap., 582,000 galls.; iron, 30 × 110 ft. Randolph: Cap., 575,000 galls.; iron, 30 × 125 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles; cost extensions met by town bonds. Taps, 380; made by town. Services, cem. lined, w. l.; paid for by property owner. Meters, 1; owned by N. Y., N. H. & H. R. R. Use of meters optional with Co. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 272,814 for both Holbrook and Randolph. PRESSURE.—Ordinary, 70 lbs.; one steam fire engine is used. FINANCIAL.—Cost of joint works, of which one-half was paid by each town, $133,615; additional cost to Holbrook, $33,128; total cost to Holbrook, $102,593; Bonded debt, $135,000, at 4%; $30,000 due in 1907, $30,000 in 1912, $40,000 in 1917, $35,000 in 1922. Sinking Fund, $24,555. Expenses, $8,493: Operating, $3,093; int., $5,400. Revenue: Consumers, $3,832; City, fire protection, $2,500. MANAGEMENT.—Prest., W. F. Gleason; Secy. and Supt., Frank G Morse; Treas., G. T. Wilde; Ch. Pump. Engr., E. J. T. Dexter. Rept. by Supt., June 8. REFERENCE.—Eng. News, Apr. 25, '95.

52. **HOLLISTON,** Middlesex Co. (2,619.) Built in '91 by Holliston Water Co. Charter provides town may buy works at any time at price to be mutually agreed upon, or fixed by appraisers. SUPPLY.—Wells and springs, pumping to stand-pipe. One of the wells is in Jar Brook valley, 26 × 30 ft., covered. PUMPS.—Cap., 1,000,000 galls.; two Deane, one being a 750,000 comp. dup. STAND-PIPE.—Cap., 317,000 galls.; iron, 30 × 60 ft. FISCAL YEAR CLOSED Jan. 31.—DISTRIBUTION.—Mains (in '92), 4.8 miles. Services, lead. FINANCIAL.—(In '92). Cap. Stock, $50,000; paid-up, $47,000. Debt, $40,000. MANAGEMENT.—Prest., C. W. Shippee; Treas., H. E. Bullard; Supt., F. A. Shippee. Rept. by Treas.

53. **HOLYOKE,** Hampden Co. (35,637.) Built in '73 by city. SUPPLY.—Wright's and Ashley's ponds, Tannery and Whiting St. brooks, by gravity. Total drainage area, 2,583 acres. RESERVOIRS.—Cap., 1,370,000,000 galls. Storage and impounding, Wright's and Ashley's ponds, separated only by road, and with connecting culvert, 750,000,000; area of two, 230 acres; Whiting Street reservoir, 550,000,000; area, 114 acres; see Eng. News, Sept. 6, '90, for description of dam; Bray Brook, 70,000,000 galls.; area, 20 acres. A 10-in. pipe connects Tannery Brook with supply main. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 59 miles; cost extensions met by receipts. Taps, 3,242; made by city for $10 for ¾-in. and $13 for 1-in. service. Services, lead lined, paid for by owner of property. Meters, 204; owned, controlled and repaired by city. Meters compulsory for mills, large manufactories, hotels and stables. Meters are only allowed to be used by large consumers. Hydrants, public, 201. CONSUMPTION.—(Galls.) av., 3,561,643. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $721,000. Bonded debt, $250,000, at 6%, due 1900. Sinking Fund, $230,000, partially invested in real estate, first mortgage, at 5%; balance cash. Expenses, $25,509: Operating, $7,984; services and repairs, $2,524; int., $15,000. Revenue: Consumers, unmetered, $58,615; metered, $14,522; City, fire protection, $3,000; public buildings, $350; service pipe, $1,534. MANAGEMENT.—Chn., M. P. Conway; Secy., J. J. Sullivan; Treas., Chas. D. Colson; Supt., John D. Hardy; Water Regr., John C. Sullivan. Rept. by Water Regr., June 5. PROJECTED IMPROVEMENTS.—Legislature of '96 authorized additional supply from the Manhan River, at Southampton, 11 miles from city. Press rept., Aug. 27, '96, stated contract for earth dam, about 800 ft. long and 19 ft. high, had just been awarded to Fred T. Ley & Co., for $16,572. Engr., Jas. L. Tighe. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, July 23, '81; Sept. 6, '90 (Whitney St. dam).

82. **HOPEDALE,** Worcester Co. (1,176.) Supply from Milford.

54. **HOPKINTON,** Middlesex Co. (4,088.) Built in '84 by town. Extended in '96 to supply village of Woodville, part of town of Hopkinton. SUPPLY.—Four driven wells, pumping to tank. Wells are respectively 75, 65, 57 and 119 ft. deep, partly in solid rock; last one is 8 ins. in diam. PUMP.—Deane. TANK.—Cap., 250,000 galls.; iron, 35 × 35 ft. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 394. Services, w. l. Meters, 15. Hydrants, public, 46. PRESSURE.—Ordinary, 80 lbs.

FINANCIAL.—Cost, $51,000. Expenses: Operating, $1,175. Revenue: Consumers, $2,500; town, $1,050. MANAGEMENT.—Comrs: Chn., R. I. Frail; Clk., S. D. O'Connell; Geo. H. Putnam. Rept. by latter, Oct. 5. REFERENCE.—Eng. News, April 18, '85.

55. **HOUSATONIC,** Berkshire Co. (Town of Great Barrington, 4,612.) Built in '88 by Housatonic Water Co. Receiver was appointed late in '95, or early in '96. Property advertised foreclosure sale for June 19, '96; press rept. Oct. 1, '96, stated equity in plant had just been sold for $5,000 to Theodore C. Woodbury, of Woodbury & Moulton, Portland, Me. SUPPLY.—Long Lake, area 160 acres, by gravity. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—(In '90.) Mains, 6.5 miles. Taps, 110. Meters, 8. Hydrants, public, 16. FINANCIAL.—Cost, est., $70,000. Bonded debt (in '88), $40,000, at 6%, due in 1908. MANAGEMENT.—Address T. C. Woodbury, Portland, Me.

56. **HUDSON,** Middlesex Co. (4,670.) Built in '84 by town. SUPPLY.—Gates' Pond, in Berlin, by gravity. Pond has area of 75 acres, drainage area, 310 acres, including water surface; av. depth, 30 ft., and max. depth, 80 ft.; bottom sandy. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 17 miles; cost extensions met by loans and income. Taps, 790; made and service laid to street line by town, free. Services, cem. lined w. i.; paid for by consumer from street line. Meters, 1; owned by town. Hydrants, public, 125; private, 2. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 55 lbs. Steam fire engines are used. FINANCIAL.—Cost, $118,397. Notes, $73,997, at 4%, payable in yearly installments. Expenses: Operating, $1,003; int., $3,100. Revenue: Consumers, unmetered, $7,888; metered, $300; City, fire protection, $1,000; public buildings, $150. No deficits since works were put in operation. MANAGEMENT.—Comrs: E. M. Stone, N. C. Tower and D. W. Stratton, Supt. Rept. by Supt., June 8. PROJECTED IMPROVEMENTS.—Nov. 30, '96, B. R. Felton, Tremont Building, Boston, reported he has been engaged to rept. on new dam and supply main. SEWERS.—None.

49. **HULL,** Plymouth Co. See Hingham.

57. **HYDE PARK,** Norfolk Co. (10,193.) Built in '85 by Hyde Park Water Co. FRANCHISE.—Provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Driven wells, numbering about 160, pumping through mains to reservoir. PUMPS.—Cap., 2,500,000 galls.; two Blake, 1,500,000 and 1,000,000, working against 220-ft. head. RESERVOIR.—Cap., 1,500,000 galls. STAND-PIPE.—Cap., 500,000 galls.; 50 x 35 ft.; observatory at top. FISCAL YEAR CLOSED March 31. DISTRIBUTION.—Mains, 32.4 miles. Taps, 1,806. Hydrants, public, 178. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost (in '90), $185,563. Cap. Stock, authorized, $100,000, all paid-up. Bonded debt, $100,000, at 5%, due 1919. MANAGEMENT.—Prest., Robert Bleakie; Treas., C. F. Allen; Supt., Albert S. Adams; Ch. Pump. Engr., F. Henderson. Rept. by Treas., July 1. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston.

58. **IPSWICH,** Essex Co. (4,439) Built in '94 by town. Engr., Freeman C. Coffin, 53 State St., Boston. SUPPLY.—Storage basin on Dow Brook, supplemented by Bull Brook, pumping to reservoir. Dow's Brook has drainage area of about 600 acres. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Snow dup. comp. cond. and auxiliary under writers' high pressure. RESERVOIRS.—Cap., 58,000,000 galls. Storage: 55,000,000; area, 17½ acres; max. depth, 20 ft.; av., 9.6 ft. FISCAL YEAR CLOSED Nov., '95. DISTRIBUTION.—Mains, 12½ miles. Taps, 600; made by town. Services, lead; paid for by town to consumer's property line. Meters, 40; owned, controlled and repaired by town. Use of meters optional with town. Hydrants, public, 107; private, 6. CONSUMPTION.—(Galls.) av., 100,000; max., 140,000; min., 75,000. PRESSURE.—Ordinary, 60 lbs.; fire, 70 lbs. FINANCIAL.—Cost (Jan., '95), $137,930. Bonded debt, $130,000, at 4%, due 1924. Sinking Fund $3,500. Expenses: Int., $1,500. Revenue: Consumers, $3,252; City, fire protection, $2,600. Deficits are met by appropriations. MANAGEMENT.—Comrs. Chn., E. H. Martin; Ch. Pump. Engr., P. A. Allen. SEWERS.—None.

59. **KINGSTON,** Plymouth Co. (1,659.) Present works built in '86 by town; first supplied in 1804 by Kingston Aqueduct Assn., whose works were bought in '88 by town. SUPPLY.—Well, filter gallery and river, pumping direct and to reservoir. Well, 20 x 18 ft., roofed and ventilated. Gallery parallel and near river and connected with well; about 1,640 ft. long, 20 ins. wide and 14 ins. high, with brick arch, except 190 ft. 10-in. pipe; 15 to 50 ft. from mill pond. PUMPS.—Cap., 825,000 galls.; Blake dup. water power and Deane dup., 500,000. RESERVOIR.—Cap., 265,000 galls.; brick, 50 ft. diam., 18 ft. deep below overflow, concrete bottom; roofed over in July, '88. DISTRIBUTION.—Mains, 9½ miles. Taps, 306. Meters, 0. Hydrants, public, 71. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $57,495. Bonded debt, $32,000, at 4%. Expenses: Int., $1,280. Revenue, $3,400; City, none. MANAGEMENT.—Three Comrs. Rept. by Supt., Michael Ormond, Sept. 26. PROJECTED IMPROVEMENTS.—Additional supply. REFERENCE.—Eng. News, Aug. 11, '88.

60. **LANCASTER,** Worcester Co. (2,201.) Acquired by town May, '98. Built in '85 by Lancaster Water Co., under 15-yr. franchise. No legal difficulties. SUPPLY.—Clinton Water-Works, which see. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 8.6 miles; cost extensions met by revenue, except for extensive additions. Taps, 194; made by Clinton Water Dept., by agreement. Services, iron; paid for by consumers. Meters, 5; owned and repaired by consumer; controlled by Comrs. Use of

meters optional with consumer. Hydrants, public, 29; private, 4. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $40,000 when purchased from Co. Since then $6,000 additional has been spent. Debt, $40,000: Floating, $20,000; on four notes. Bonded, $20,000, at 5%, due 1901. No Sinking Fund, but $3,000 of the debt is paid annually by taxation. Expenses: Operating, town pays to Clinton one-half of all its gross receipts and Clinton makes all connections, repairs, etc. Revenue, $4,284.87; City, fire protection, $1,654.25; gross receipts, $2,630.62; paid to Clinton, $1,325.31; net revenue, $2,979.56. MANAGEMENT.—Prest., Harold Parker, South Lancaster; Secy., A. C. Hawkins; Treas., W. H. Blood. Rept. by Prest., Aug. 24.

61. **LAWRENCE,** Essex Co. (44,654.) Built in '73-5 by city. SUPPLY.—Merrimack River, above dam of Essex Co., pumping to reservoir and direct. Drainage area, 4,684 sq. miles. PUMPS.—Cap., 10,000,000 galls.; two 5,000,000 Leavitt dup., built by Morris Mfg. Co. Cumberland coal used; av. cost, $3.95 per short ton. FILTERS.—Cap., 5,000,000 galls. Sand, intermittent; area, 2½ acres; depth, 3 to 5 ft. See Eng. News, Aug. 3, '93, for illustrated description of filter beds and also for description of old filter galleries. RESERVOIRS.—Cap., 40,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 68.8 miles; cost of extensions met by revenue. Taps, 5,654; made by city, free. Services, lead; paid for by city to property line, thence by consumer. Meters, 3,000; owned by consumer; controlled and repaired by city; yearly rental, 15% of cost. Use of meters compulsory for corporations. City can compel the use of meters in case of waste and any consumer may have one. Hydrants, public, 542; private, 172. CONSUMPTION.—(Galls.) av., 3,005,624. PRESSURE.—Ordinary and fire, 65 lbs. Steam fire engines are used. FINANCIAL.—Cost, $2,168,591. Debt, $902,000, all bonded; $602,000 at 4%, due in 30 yrs.; $300,000, at 6%, due $200,000 in 1906 and $100,000 in 1900. Expenses: Operating, $34,776; int., $42,470. Revenue: Consumers, $89,373; city, none. Deficits met by taxation. MANAGEMENT.—Prest., Louis P. Collins; Secy. and Supt., A. H. Salisbury; Ch. Pump. Engr., Martin K. Sawyer. Rept. by Supt., June 5. PROJECTED IMPROVEMENTS.—High service system, appropriation made and main pipe ordered. Press rept. latter part of '96 stated that contracts had been awarded for high service Barr pump at $9,500; also for steel stand-pipe, to E. Hodge & Co., East Boston, at $11,161. SEWERS.—Has storm sewers only. REFERENCES.—Eng. News; general: Sept. 5, 19, '78; July 16, '81. Filtration: Jan. 5, April 6, Aug. 3, Nov. 30, Dec. 14, '93; June 21, Aug. 16, Oct. 4, Nov 29, 94.

62. **LEE,** Berkshire Co. (3,785.) Built in '81 by Berkshire Water Co.; originally for domestic supply, only. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $400 per yr. for public service. No legal difficulties. SUPPLY.—Impounding and distributing reservoirs on Codding Brook, by gravity. Drainage area, mountainous, 6 sq. miles. RESERVOIRS.—Cap., 21,500,000 galls. Impounding, 20,000,000; area, 22 acres; max. depth, 8 ft.; bottom, muddy. Distributing, 1,500,000; max. depth, 20 ft.; 212 ft. above village. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 3½ miles. Taps, 300; made by Co. free. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters: Co. can compel use of meters and any consumer may have one. Hydrants, public, 21; private, 1. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $45,000. Cap. Stock, authorized, $20,000; all paid-up; paid 6% div'd in '95-6. Debt, $24,000: Floating, $4,000; Bonded, $20,000, at 5%, due 1904. Expenses: Operating, $1,100; int., $1,150; taxes, $325. Revenue: Street sprinkling, $48. MANAGEMENT.—Prest., Geo. K. Baird; Secy., Treas. and Supt., J. C. Chaffee. Rept. by Supt., July 14. SEWERS.—Partial sanitary system. REFERENCE.—Eng. News, Sept. 23, '82.

96. **LEEDS,** Hampshire Co. Supply from Northampton.

63. **LEICESTER,** Worcester Co. (3,120.) Built in '89-91 by water supply district. SUPPLY.—Springs and collecting wells, by gravity, with compensating stand-pipe. One well is 30 ft. in diam., 12 ft. deep; 7 are 6 to 7 ft. diam., 8 to 12 ft. deep. STAND-PIPE.—Cap., 210,000 galls.; 30 × 40 ft., top on same level as surface of ground at wells. FISCAL YEAR CLOSED April 1. FINANCIAL.—Cost (in '94), $60,619. Expenses: Operating, $2,749. Revenue, $3,585. MANAGEMENT.—Water Comrs.

64. **LENOX,** Berkshire Co. (2,889.) Built in '75 by Lenox Water Co. SUPPLY.—Springs, pumped from impounding reservoir over ridge to distributing reservoirs, and river, pumping to reservoir in case of need. Drainage area of reservoirs, ¾ sq. miles (est.). RESERVOIRS.—Cap., 20,500,000. Impounding: 500,000-gall. reservoir on tributary of Williams River was supplemented about '90 or '91 by reservoir on same stream, cap. of which was increased to about 20,000,000 galls. (est.) in '95; area, 7 acres; depth, 6 to 30 ft. Distributing: Old, cap. not given; new (built about '90), cap., 1,500,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 12 miles. Taps, 183. Meters, 2. Hydrants, 8. CONSUMPTION.—Not given. FINANCIAL.—Cost, $43,142. Cap. Stock: Authorized, $30,000; paid-up, $22,000. Bonded debt, $26,000. NOTE.—No report since '90-'91 Manual. REFERENCE.—Eng. News, Feb. 28, '82.

65. **LEOMINSTER,** Worcester Co. (7,269.) Built in '73 by town. SUPPLY.—Morse and Haynes brooks, by gravity from impounding and distributing reservoirs. Drainage area, 1,215 acres. Press rept. states connection has been made with Fitchburg works, for emergency use. RESERVOIRS.—Cap., 134,750,000 galls. (est.); Haynes, 121,000,000; area, 58 acres; max. depth, 12 ft., general depth, 7 ft., about ¼ being very shallow.

Morse, 7,000,000; area, about 10 acres. Distributing, 6,750,000; area, 4½ acres, on Quarter-of-a-Mile brook, formed by junction of Morse and Haynes brooks. Filter Dam: Built in '84, across brook, just above distributing reservoir; rough stone wall, behind which are layers of cobblestone, coarse and fine gravel. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 82 miles; cost extensions met by assessments. Taps, 1,626; made by town. Services, w. l., cem. lined; paid for by town to street line, thence by consumer. Meters, 50; owned, controlled and repaired by town; no yearly rental. Town can compel use of meters and any consumer may have one. Hydrants, public, 214; private, 8. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 80 lbs.; one steam fire engine. FINANCIAL.—Cost, $314,270. Expenses: Operating, $7,541; int., $8,274. Revenue: $29,236: Consumers, $20,828; City, fire protection, $8,408. MANAGEMENT.—Prest., W. H. Chase; Secy., S. A. Stevens; Treas. and Supt., J. G. Tenney. Rept. by Supt., June 22. PROJECTED IMPROVEMENTS.—New reservoir of 350,000,000 galls. cap., under construction, to be called Fall Brook Reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 20, '82.

66. **LEXINGTON,** Middlesex Co. (3,197.) Purchased by town Dec. 10, '95, for $200,000. Built in '84 by Lexington Water Co. SUPPLY.—Wells and filter gallery, pumping to reservoir. 20 × 29 ft., 20 × 18 ft., 12 × 11 ft., 10 × 11 ft., and 8-in. driven well, 190 ft. deep, from which water is lifted by deep-well pump. Two smallest surface wells (at least) are covered. Filter gallery, added in '92, 70 ft. long, 6 ft. wide, 6 ft. high; also well, besides those given above. PUMPS.—Cap., 1,500,000 galls.; Blake, 500,000; Knowles, 1,000,000. Pocahontas or Clearfield coal used; av. cost, $4.60 per short ton, delivered. RESERVOIRS.—Cap., 16,000,000 galls.; formed by earth dam, 1,000 ft. long, 29 ft. high, masonry heart-wall. Built in '94-5. Engr., Louis E. Hawes, Tremont Building, Boston. STAND-PIPE.—Cap., 55,000 galls.; iron, not covered, 18 × 25 ft. DISTRIBUTION.—Mains (in '90), 6 miles; cost extensions met by bonds. Taps, 380; made by water dept., free. Services, lead; paid for by property owner. Meters, 1. Use of meters optional with town. Hydrants, public, 61. CONSUMPTION.—(Galls.), max., 200,000; min., 120,000. PRESSURE.—Ordinary, 64 lbs.; fire, 90 lbs.; steam fire engines are used. FINANCIAL.—Cost (purchase price), $200,000. Bonded debt, $200,000, due $10,000 annually. Revenue, $10,000. MANAGEMENT.—Comrs.; W. Smith, D. C. Whitcher, F. H. Locke. Rept. by Leonard A. Saville, Aug. 15. SEWERS.—None. REFERENCE.—Eng. News, Sept. 3, '96 (yield of springs) illus.

67. **LINCOLN,** Middlesex Co. (987.) Built in '75 by town. SUPPLY.—Sandy Pond, pumping to reservoir. Pond has area of 152 acres, drainage area, 178 acres, excluding water surface; is drawn from by Concord, also. PUMPS.—Cap., 450,000 galls.; Worthington non-comp. non-cond. Pocahontas coal used; av. cost, $4.45 per short ton. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by taxation. Taps, 103; made by town. Services, cement lined and galv. l.; paid for by owner. Meters, 4; owned, controlled and repaired by town. Use of meters optional with town; compulsory for R. R. and greenhouses. Hydrants, public, 39. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 10 lbs.; fire, 75 lbs. FINANCIAL.—Bonded debt, $20,000, at 4%, due $1,000 each year until paid. Interest paid from income. No sinking fund. Expenses: Operating, $3,019; int., $800. Revenue, $4,141: Consumers, $3,300; City, fire protection, $195; public buildings, $48; other purposes, $598. All expenses paid out of income. MANAGEMENT.—Chn., Leonard W. Wiston; Secy. and Treas., Geo. L. Chapin; Ch. Pump. Engr., James T. Laird. Rept. by Secy., June 23. SEWERS.—None. REFERENCE.—Eng. News, Dec. 17, '81.

68. **LONG MEADOW,** Hampden Co. (2,183.) Built in '95 by town. Engr., Wm. B. Medlicott. Contrs., Thos. D. Watters and C. L. Goodhue, latter of Springfield. SUPPLY.—Spring-fed brook, pumping to tank. Brook is diverted into well 30 ft. sq., 8½ ft. deep, with wooden roof. Drainage area, about ½ sq. mile. PUMPS.—Cap., 750,000 galls.; Deane comp. dup. Bituminous coal used; av. cost $4.70 per short ton. RESERVOIR.—Cap., 100,000 galls. TANK.—Cap., 88,000 galls.; iron, 23 × 30 ft., on trestle 70 ft. high. FISCAL YEAR CLOSED March 15. DISTRIBUTION.—Mains, 6 miles; cost extensions met by taxation and income. Taps, 80; made by town; fee varies with width of street. Services, galv. l.; paid for by consumer. Meters, 0. Hydrants, public, 37; private, 2. CONSUMPTION.—(Galls.) av., 30,000; max., 80,000; min., 10,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $33,000. Bonded debt, $30,000, at 4%, due 1925. Sinking Fund: $400, deposited in savings bank at 4%. Expenses, Int., $1,200. Revenue: Consumers, unmetered, $850. MANAGEMENT.—Water Board. Secy. and Treas., Wm. F. Emerson; Supt. and Ch. Pump. Engr., Moses Field. Rept. by W. B. Medlicott. PROJECTED IMPROVEMENTS.—None. SEWERS.—None.

69. **LOWELL,** Middlesex Co. (77,696.) Built in '72 by city. SUPPLY.—Driven wells, pumping to reservoirs. Supply formerly from Merrimack River and filter gallery; small filter bed was also used; see '90-1 Manual. Full driven well supply, which comprises a large number of driven wells, not available until '96. PUMPS.—Cap., 34,000,000 galls.; Worthington, 12,000,000 hor. comp. high duty, 5,000,000 comp. cond., 2—3,000,000 comp. non-cond.; Deane, 2—3,000,000 comp. dup.; Morris, 5,000,000. Bituminous coal used; av. cost, $4 per short ton. RESERVOIRS.—Cap., 31,324,000 galls.; Beacon street low service, 30,000,000; 181½ ft. above city datum. Tenth street high service, 1,324,000. FISCAL YEAR CLOSED Dec. 20, '95. DISTRIBUTION.—Mains, 115 miles; cost exten-

sions met by revenue. Taps, 9,686; made by city, free. Services, lead; paid for by consumer, but laid by city. Meters, 3,232; owned by consumer; controlled and repaired by city, latter at expense of consumer. Use of meters optional with consumer. Hydrants, public, 1,039. CONSUMPTION.—(Galls.) av., 7,000,000; max., 12,000,000; min., 6,000,000. PRESSURE.—Ordinary and fire, 60 lbs.; steam fire engines used. FINANCIAL.—Gross cost, $6,081,310; net cost, $2,530,119. Bonded debt, $1,256,000, at 4%; $45,000, at 3½%. Sinking Fund, $177,205, invested in city and town bonds, at (av.) 5%. Expenses: Operating, $80,333; int., $50,470. Revenue, $266,938: Consumers, unmetered, including sewer flushing, $118,889; metered, including public buildings, $99,592; City, fire protection, $12,468; street sprinkling, $60 per annum; other purposes, $20,325. No deficits. MANAGEMENT.—Prest., Geo. E. Putnam; Secy., John W. Crawford; City Treas., Chas. F. Coburn; Supt., Robt. J. Thomas. Rept. by Supt., June 15. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News: Test of Worthington Pump, Apr. 16, '92; general, June 11, '81; driven wells, Sept. 28, '93, June 21, '94, Oct. 24, '95.

70. **LUDLOW,** Hampden Co. (1,939.) Works built in '75 by Ludlow Mfg. Co. Supply from Springfield. Water supplied to Ludlow Mfg. Co. at 20% discount from Springfield rates, and to other consumers at full rate. Hydrants, $20 each. No report since '89 Manual.

71. **LYNN,** Essex Co. (55,727.) Built in '70-72 by city. Supplies Saugus, refunding part of rates collected. SUPPLY.—Brooks and Saugus River, by gravity to pump wells, thence by pumping to reservoir and to tank for high service. Drainage area, 5.18 sq. miles, not including that of Saugus River, added in '94, some 12 to 15 miles of which is available for Lynn. PUMPS.—Cap., 18,000,000 galls.; Leavitt, 5,000,000, Loretz, 10,000,000, and 2—1,500,000. Pocahontas coal used; av. cost, $4.50, $4 and $3.65 per short ton. RESERVOIRS.—Storage: Cap., 1,167,000,000 galls.; Breeds', 283,000,000; Birch, 381,000,000; Malden, 403,000,000; Glen Lewis, 120,000. Distributing: Cap., 60,000,000 galls.; 177 ft. above mean high tide. STAND-PIPE.—Cap., 500,000; 50 × 30 ft.; built in '95; Contrs., E. Hodge & Co. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 125 miles, including pipe in Saugus and Swampscott. Taps, 11,442, including 607 in Saugus. Services, cement-lined and galv. i. Meters, 1,206. Hydrants, public, 786. CONSUMPTION.—(Galls.) av., 4,360,142. PRESSURE.—50 to 65 lbs. FINANCIAL.—(In '95.) Cost, $2,232,430. Bonded debt, $1,775,300, at 3½ to 5%. Sinking Fund, $339,276. Expenses: Operating, $51,147; int., $71,183. Revenue, Consumers, $180,215. MANAGEMENT.—Public Water Board. Prest., W. B. Littlefield; Supt., Jno. C. Haskell; Ch. Pump. Engr., C. A. Cowles. Rept. from annual rept. for '95. SEWERS.—Has sewers. REFERENCE.—Eng. News, July 23, '81.

72. **MALDEN,** Middlesex Co. (23,081.) Built in '69 by city. SUPPLY.—Spot Pond, by gravity for low service and driven wells, pumping to tank for high service. Area of pond, 296 acres; drainage area, 992 acres, excluding water surface of Spot and Doleful ponds, latter of 8 acres; at low water is 135 feet above marsh level, and at high water, 143 ft. Cap., first 8 ft. from surface, 554,000,000 galls.; first 15 ft., 837,000,000 galls. Pond drawn upon by Malden, Medford and Melrose, each having right to one-third. Municipalities jointly have assumed sanitary protection of pond. Driven wells are in Eaton's Meadows, Malden; in '90 were described as 51, sunk to rock at av. depth of 65 ft.; in '94, 26 wells were added, 2½ in. diam. and av. depth of 41 ft. PUMPS.—Cap., 4,000,000 galls. Two Blake, 2,000,000 galls. each. George's Creek Cumberland coal used; av. cost, $3.47 per short ton. TANK.—Cap., 1,080,000 galls.; iron, covered, 75 × 35 ft.; elev., 215 ft. to base. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 80 miles; cost extensions met by appropriations. Taps, 5,733; made by city, free. Services, lead; paid for by city to street line, thence by consumer. Meters, 1,577; owned, controlled and repaired by city; yearly rental, $2. Use of meters: City can compel the use of meters and any consumer may have one. Hydrants, public, 341. CONSUMPTION.—(Galls.) av., 1,459,949. PRESSURE.—Low service, 52 lbs.; high service, 98 lbs; steam fire engines are used. FINANCIAL.—Cost, $917,148. Bonded debt, $490,000, at 4%, due 1901 to 1915; $15,000, at 3½%, due Apr. 1, '96; $50,000, at 6%, due July 1, '96, and $25,000, at 3½%, due July 1, 1905. Sinking Fund, $57,819. Expenses: Operating, $27,100; int., $24,090. Revenue: Consumers, $93,677 (total); metered, $9,935. MANAGEMENT.—Comrs. Rept. by George W. Barrett, Water Registrar, Nov., '96. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary and storm sewers.

73. **MANCHESTER,** Essex Co. (1,789.) "Pop. in winter about 1,790-1,800; in summer about 3,000."—R. C. L. Built in '91-92 by town; put in operation Feb, '92. SUPPLY.—Collecting and driven wells, pumping to stand-pipe. Well, 33 ft. diam. at top, 31 at bottom, 29 ft. deep, with driven wells in bottom. In '95 five 4-in. wells, 27 to 34 ft. deep, were sunk in valley of Sawmill Brook, near Coolidge Spring, near large well; water is pumped from them through 6-in. pipe to large well. PUMPS.—Cap., 1,000,000 galls.; two comp. cond., 500,000. STAND-PIPE.—Cap., 517,000 galls.; 35 × 75 ft.; Contr., Cunningham Iron Works, Boston. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 17½ miles; cost extension met by annual appropriation. Taps, 485. Meters, 0. Hydrants, public, 138. CONSUMPTION.—(Galls.), max., 378,480. FINANCIAL.—Cost, $200,000. Bonded debt, $124,000, at 4%; $6,000 retired each year. Expenses: Operating, $3,573. Revenue, $11,820: Consumers, $8,820; City, $3,000. MANAGEMENT.—Three Comrs. Chn., Roland C. Lincoln; Supt., F. M. Andrews. Rept. by Chn., Oct. 7.

74. **MANSFIELD,** Bristol Co. (3,432.) Built in '88 by water supply district. SUPPLY.—Cate springs, near Canoe River, pumping from collecting well to stand-pipe and direct. Well, 25 x 20 ft., roofed. PUMPS.—Cap., 300,000 galls.; Blake. George's Creek Cumberland coal used; av. cost, $3.80 per short ton. STAND-PIPE.—Cap., 367,200 galls.; 25 x 100 ft. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 15¼ miles; cost extensions met by bonds. Taps, 498; made by district, free. Services, galv. i.; paid for by district to street line, thence by consumer. Meters, 130; owned by consumer, controlled and repaired by district. District can compel use of meters and any consumer may have one. Hydrants, public, 88. CONSUMPTION.—(Galls.) av., 139,000; max., 370,000; min., 110,000. PRESSURE.—Ordinary, 55 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $100,000. Bonded debt, $75,000, at 4%, due 1918; $25,000, at 4%, due 1925. Expenses: Operating, $2,200; int., $4,000; taxes, $150. Revenue: Consumers, $3,819; City, fire protection, $1,500. Deficits are met entirely by taxation. MANAGEMENT.—Comrs.: D. S. Spaulding, A. B. Day, Wm. B. Rogerson; Treas., A. V. Rogerson; Ch. Pump. Engr., A. Buck. Rept. by A. B. Day, June 9. SEWERS.—None.

75. **MARBLEHEAD,** Essex Co. (8,202.) Distribution put in in '87 by town, water being bought from Marblehead Water Co. of Swampscott. In '89 independent supply and pumping station secured; fire protection system built in '78. SUPPLY.—45 driven wells, two collecting wells, pumping to stand-pipe. Wells are near mouth of Forest River; tide gate was built across river, but some of the driven wells are reported by Mass. State Board of Health as salt and abandoned. In Sept., '90, a 30 x 34-ft. well was sunk as far as possible from tide gate, and in '95 a 25 x 34-ft. well was sunk in bed of pond near pumping station. PUMPS.—Cap., 2,250,000 galls. Deane comp. cond. dup. 1,500,000; Worthington 750,000 non-comp. non-cond. Cumberland coal used; av. cost, $3.89 per long ton. STAND-PIPE.—Cap., 530,000 galls.; iron, 30 x 100 ft., 177 ft. above high water in wells. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 28½ miles; cost extensions met by bonds. Taps, 1,225. Services, galv. i.; paid for by consumer. Meters: 2; owned, controlled and repaired by consumer; yearly rental, 10% of cost. Use of meters compulsory for glue works, wharves, etc. Town can compel use of meters and any consumer may have one. Hydrants, public, 301. CONSUMPTION.—(Galls.) av., 268,324; max., 652,000; min., 101,558. PRESSURE.—Ordinary and fire, 70 lbs. Steam fire engines used in an emergency. FINANCIAL.—Cost, $319,898. Bonded debt, $228,000, at 4%. Expenses: Operating, $3,000. Revenue: Consumers, unmetered, $15,626. Deficits: Bonds which come due each year (about $8,000) are met by taxation. MANAGEMENT.—Prest. and Supt., Robt. C. Bridge; Secy., Thos. Ingalls, Jr.; Ch. Pump. Engr., Thos. Main. Rept. by Supt., July 27. SEWERS.—None.

76. **MARLBOROUGH,** Middlesex Co. (13,805.) Built in '83 by city. SUPPLY.—Lake William and Millham reservoir, pumping to reservoir and direct; also pumping to stand-pipe for special fire protection (see below). PUMPS.—Cap., 6,500,000 galls. Blake comp. cond. dup., 2,500,000; Barr comp. dup., 1,500,000; Worthington hor. comp. high duty, 2,500,000. Cumberland coal used; av. cost, $4.45 per short ton. RESERVOIRS.—Cap., 705,500,000 galls. Impounding: Lake William, 300,000,000; area, 72 acres; general depth, 10 to 26 ft., with muddy bottom; Lake Millham, 400,000,000; Distributing: Mt. Sligo, 5,500,000. STAND-PIPE.—Cap., 200,000 galls., iron 30 x 35 ft., on steel trestle 75 ft. high. Conical base. Supplies three miles of mains and 36 hydrants and is used for fire protection, only, on higher levels. FISCAL YEAR CLOSED Dec. 31 '95. DISTRIBUTION.—Mains, 36 miles; cost extensions met by bonds. Taps, 2,209; made by city. Services, lead lined; paid for by city to street line, thence by property owner. Meters: 844; owned by consumer; controlled and repaired by city. Use of meters compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 324; private, 5. CONSUMPTION.—(Galls.) av., 510,000; max., 620,000; min., 400,000. PRESSURE.—65-135 lbs. FINANCIAL.—Cost, $534,000. Bonded debt, $326,000, at 4%. Sinking Fund: $111,000, invested in Marlboro water and sewer bonds, at 4%. Expenses, operating, $8,771. Revenue: Consumers, unmetered, $17,468; metered, $17,219; school buildings, $36. Deficits met by taxation. MANAGEMENT.—Prest., J. A. O'Connell; Treas., B. F. Greely; Supt. and Ch. Pump. Engr., G. A. Stacy. Rept. by Supt., June 12. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, Jan. 12, '84; pumping station, July 6, '93.

77. **MAYNARD,** Middlesex Co. (2,700.) Built in '89 by town. SUPPLY.—White Pond in Stow and Hudson, by gravity to 120,000-gall. receiving well at pumping station, thence pumping to reservoir. Area of pond, 58 acres; drainage area, 125 acres, excluding water surface. PUMPS.—Cap., 1,000,000 galls. Blake comp. cond. high and low pressure. Bituminous coal used; av. cost, $4 per short ton. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by appropriations. Taps, 433; made by town, free. Services, cem. lined; paid for by town to street line, thence by consumer. Meters: 30; owned by consumer and town; controlled by town; repairs paid by consumer. Town can compel use of meters, and any consumer may have one. Hydrants, public, 66; private, 12. CONSUMPTION.—(Galls.) av., 86,599. PRESSURE.—Ordinary and fire, 60-90 lbs. FINANCIAL.—Cost, $110,783. Bonded debt, $117,000, at 4%; due 1919. Sinking Fund, $6,216, at 4%. Expenses: Operating, $1,563. Revenue: Consumers, unmetered, $4,109; metered, $872; City, fire protection, $2,000. MANAGEMENT.—Treas., W. H. Gutteridge; Supt. and Ch. Pump. Engr., Thos. Naylor. Rept. June 15. SEWERS.—Partial system of storm sewers.

78. **MEDFORD,** Middlesex Co. (11,079.) Built in '70 by city. SUPPLY.—Spot and Wright's pond, by gravity and pumping to stand-pipe. Spot pond (see Malden); Wright's pond, storage cap., 30,000,000 galls.; area, 23 acres; av., depth, 10 ft.; drainage area, 168 acres, excluding water surface. PUMPS.—Cap., 4,000,000 galls.; Deane, two 2,000,000 dup. underwriter. Pocahontas coal used; av. cost, $4.00 per short ton. STAND-PIPE.—Cap., 450,000 galls.; steel; 35 × 60 ft. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 53 miles; cost extensions met by taxation. Taps, not given; made by city. Services, cem. lined; paid for by city to property line, thence by property owner. Meters: 65; owned, controlled and repaired by city. Use of meters compulsory for factories, liveries and blocks. City can compel use of meters. Hydrants, public, 390; private, 3. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,200,000; min., 700,000. PRESSURE.—Ordinary, 35 to 90 lbs. Fire engines in use. FINANCIAL.—Cost, $726,265. Bonded debt, $458,000 at 4%. Sinking Fund: $69,504. Expenses, $30,714: Operating, $14,974; int., $15,740. Revenue, $48,897. MANAGEMENT.—Water Comrs. Prest., F. E. Chandler; Secy., Fred. L. Cushing. Rept. by Supt. F. W. Gow. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Feb. 18, '82.

P 4. **MEDWAY,** Norfolk Co. (2,985.) Medway Water Co. was incorporated in '92, but up to June, '96, had not built works.

79. **MELROSE,** Middlesex Co. (8,519.) Built in '70 by city. SUPPLY.—Spot Pond (see Malden) by gravity and pumping to reservoir. PUMPS.—1,000,000. Knowles rept. by Supt.; 1,200,000 comp. non-cond. Worthington; rept. by maker. George's Creek coal used; av. cost, $5 per short ton. RESERVOIRS.—Cap., 1,500,000 galls.; 140 ft. above marsh level. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 43 miles; cost extensions met by bonds. Taps, 3,000; made by town, free. Services, lead lined iron; paid for by town to street line, thence by consumer. Meters: 50; owned, controlled and repaired by town; yearly rental, $2. Use of meters optional with town; compulsory for stables, laundries, factory and stores. Hydrants, public, 218. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,200,000; min., 800,000. PRESSURE.—Ordinary, 78 lbs. Steam fire engines are used. FINANCIAL.—Cost, $369,418. Bonded debt, $259,000, at 4%. Expenses: Operating, $22,000. Revenue: Consumers (in '90), $24,764; City, fire protection, $3,000. MANAGEMENT.—Registrar, Levi S. Gould; Supt., J. W. Riley; Ch. Pump. Engr., C. F. Churchill. Rept. by Supt., Sept. 26. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 18, '82.

P 5. **MERRIMAC,** Essex Co. (2,633.) Mar., '96, town appointed Com. to investigate introduction of works. Stated in Nov., '96, that surveys were being made by L. E. Hawes, Tremont Building, Boston. Com. will probably rept. at town meeting, Mar., '97. Chn. Com., J. B. Judkins; Secy., S. A. McConnell.

80. **METHUEN,** Essex Co. (4,814.) Put in operation Sept., '94, by town. Engr., Frank L. Fuller, 12 State St., Boston. Contr., E. E. Eglee, Flushing, N. Y. Fire protection plant built in '76 by town, and in '90 it was reported that part of town was supplied by Lawrence. In May, '92, Methuen Water Co. was incorp. In Mar., '93, town voted to rent hydrants if Co. would build works, but immediately after steps were taken to buy Co.'s franchise in accordance with rights given town by Co.'s charter. Franchise was bought by town for $1,108, which included legislative and preliminary engineering expenses. SUPPLY.—45 driven wells, pumping to reservoir; wells 2½ ins. diam.; av. depth, about 29 ft. PUMP.—Cap., 1,500,000; Deane comp. cond. dup. Bituminous coal used; av. cost, $3.50 per short ton. RESERVOIRS.—Cap., 1,500,000 galls.; covered by brick arches. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 18.5 miles; cost extensions met by bonds; guaranteed revenue of 4% of cost is required. Taps, 610; made by town, free. Services, w. i. cem.-lined; paid for by town to street line, thence by consumer. Meters: 475; owned, controlled and repaired by town. Town can compel use of meters and any consumer may have one. Propose to meter every service, but do not put meter on until service has been used for some time. Hydrants, public, 168; private, 4. CONSUMPTION.—(Galls.) av., 150,000; max., 300,000; min., 115,000. PRESSURE.—Ordinary, 65-125 lbs. FINANCIAL.—Cost, $161,000. Bonded debt, $165,000, at 4%, due 1924. Sinking Fund: $6,360, invested at 4%. Expenses: Operating, $3,500; int., $6,600. Revenue: Consumers, unmetered, $5,500; metered, $4,500. Deficits met by taxation. MANAGEMENT.—Prest., Edwin J. Castle; Secy., D. W. Tenney; Supt., J. Alfred Welsh, Box 412. Rept. by Supt., June 5. PROJECTED IMPROVEMENTS.—More driven wells. SEWERS.—None.

81. **MIDDLEBOROUGH,** Plymouth Co. (6,065.) Built in '85 by fire district. SUPPLY.—Covered well, 22 × 26 ft., near Nemasket River, pumping through mains to stand-pipe. PUMPS.—Cap., 1,728,000 galls. Two Deane 864,000 comp. dup. cond. Bituminous coal used; av. cost, $4.75 per short ton delivered. STAND-PIPE.—Cap., 235,000 galls.; iron, 20 × 108 ft., 8,907 ft. from, top 108 (?) ft. above pumping station; water delivered at top, drawn from bottom. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 14 miles; cost extensions met by income. Taps, 697; made by district, free. Services, lead-lined iron; paid for by district to street line, thence consumer pays 30 cts. per ft. Meters: 256; owned by owner of property; controlled and repaired by district; yearly rental, about 10% of cost. Use of meters compulsory for

large consumers. District can compel use of meters and any consumer may have one. Hydrants, public, 102; private, 3. CONSUMPTION.—(Galls.) av., 213,378. PRESSURE.—Ordinary, 50-90 lbs. FINANCIAL.—Cost, $102,465. Bonded debt, $67,500, at 4%; due from 1896 to 1918. Sinking Fund: $2,134, deposited in national and savings banks at from 2% to 4%. Pay one bond every year. Expenses: Operating, $4,189; int., $2,774. Revenue: Consumers, unmetered, $4,214; metered, $6,442; City, $2,000 for all purposes. Operating expenses paid from income and balance transferred to pay for extensions. No deficits. MANAGEMENT.—Chn., Amos H. Eaton; Secy. and Supt., Jos. E. Beals; Treas., Foster A. Harlow; Ch. Pump. Engr., A. R. Gurney. Rept. by Supt., Jan. 1. SEWERS.—Partial sanitary and storm sewers.

84. **MIDDLETOWN,** Essex Co. (924.) Supply from Danvers.

82. **MILFORD AND HOPEDALE,** Worcester Co. (Milford, 8,780; Hopedale, 1,176.) Built in '82 by Milford Water Co. Town of Hopedale was set off from Milford in '86. FRANCHISE.—Perpetual from '82. Provides for purchase of works by city at any time. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. Hydrant contract renewed in '91, terms not given. No legal difficulties. SUPPLY.—Charles River for fire purposes and emergency domestic use, and three wells for domestic use, pumping direct. Wells, 23, 19 and 14 ft. diam., 30 ft. deep; all covered and connected; on bank of Charles River, which is kept at uniform height by small dam. PUMPS.—Cap., 4,500,000 galls. Worthington, comp. cond., 2,000,000; Holly, quadruplex, 1,500,000; Knowles, 500,000. Bituminous coal used; av. cost, $4 per short ton. FILTER BED.—Cap., 350,000 to 400,000 galls.; area, about ¼ acre; filtering material, about 5 ft. of sand. Built in '95 to filter supply from river; about 400,000 galls. per day reported as filtered for a while in '95. There is a small settling basin. RESERVOIR.—On river above wells; area, 90 acres; max. depth, 25 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 35 miles; cost extensions met by stock and bonds. Taps, 1,200; made by Co. Services, lead; paid for by Co. to sidewalk, thence by consumer. Meters: 150; owned by Co. and consumers; controlled and repaired by Co. Use of meters compulsory for manufacturers, R. R. and street sprinklers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 113; private, 2. CONSUMPTION.—(Galls.) av., 700,000; max., 1,000,000; min., 500,000. PRESSURE.—Ordinary, 10-85 lbs.; fire, 70-125 lbs. One steam fire engine is used. FINANCIAL.—Cost (in '90), $257,789. Cap. Stock: Authorized, $200,000; paid-up, $150,000. Bonded (in '90), $130,000. MANAGEMENT.—Prest., Chas. W. Shippee; Secy. and Treas., F. J. Dutcher, Supt. and Ch. Pump. Engr., F. L. Northrop, resigned Jan. 11, '97, to take effect March 1. Rept. by Prest. (?). REFERENCE.—Eng. News, Apr. 22, '82.

83. **MILLBURY,** Worcester Co. (4,428.) Built in '95 by Millbury Water Co.; put in operation Nov. 16. Engrs., Shedd & Sarle, Worcester. Contrs., Worcester Engineering Co., Worcester. CHARTER.—Provides for purchase of works by city. Rates are not fixed in charter nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $40 per hydrant and per watering trough per yr. Contract of 10 yrs. for 60 hydrants. No legal difficulties. SUPPLY.—Well, pumping to reservoir. Well of masonry, 20 ft. in diam., 35 ft. deep, in coarse gravel and sand, walls laid in cement from top half way to bottom to exclude surface water, balance laid dry to admit spring water, covered. PUMPS.—Cap., 2,500,000 galls. Gould 10 × 12 triplex power pump; cap., 1,750,000; driven by Buckeye cross-comp. steam engine, same engine running dynamos of the electric light Co.; also an auxiliary Barr dup. non-comp. cond. steam pump, 750,000. Bituminous coal used. RESERVOIR.—Cap., 1,500,000 galls. On Burbank Hill, circular, 130 ft. in diam., 15 ft. deep; masonry walls laid in cement; walls backed by puddled earth rolled; covered to prevent growth of algae; wooden roof, tarred and gravelled, supported by iron columns; ventilators. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 11 miles; extensions made by Co. when 8% revenue is guaranteed. Taps, 126; made by Co. Services, lead-lined iron; paid for by Co. to street line. Meters: 6 or 8; owned, controlled and repaired by Co.; yearly rental, $3. Co. can compel use of meters and any consumer may have one. Hydrants, 63. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 100 to 127 lbs. Steam fire engines are used. System will admit of the use of 15 fire streams, 100 ft. high, at one time, with a pressure of about 87 lbs. FINANCIAL.—Cost, about $200,000. Cap. Stock: Authorized, $125,000; paid-up, $111,800; paid no div'd in '95-6. MANAGEMENT.—Prest., J. Herbert Shedd, Providence, R. I.; Secy. and Treas., Herbert A. Ryan; Supt., H. S. Mathews; Ch. Pump. Engr., E. A. Cross. Rept. by Edw. Shedd, of Shedd & Sarle. SEWERS.—None.

84. **MILLERS FALLS,** Franklin Co. (Town of Montague, 6,296.) Built in '96 by water supply district; put in operation Nov. 10. Engr., Percy M. Blake, Hyde Park. Contr., F. H. King. FRANCHISE.—30 yrs. from '96. SUPPLY.—From works of Turner's Falls water supply district. Both districts are in town of Montague. RESERVOIR.—Cap., 1,270,000 galls. DISTRIBUTION.—Mains, 3¼ miles. Taps, 50. Services, galv. i.; paid for by district. Meters, 1; owned by district. Use of meters optional with district. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 103 lbs.; fire 123 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $15,000, at 4%; due in 1926. Sinking Fund: $300, invested at 4%. Expenses; Int., $600. Revenue: Consumers, unmetered, $50. City, fire protection, $700; sewer flushing, $25; public buildings, $25. About $400 will be raised annually

by taxation. MANAGEMENT.—Secy., J. E. Kavanaugh; Treas., J. D. Lynch; Supt., F. H. Giles. Rept. by Secy., Dec. 30. SEWERS.—Has sanitary and storm sewers.

85. **MILLIS,** Norfolk Co. (786.) Now owned by town. Built in '91 by Millis Water Co.; bought by town Jan., '95. Consult. Engr. for town at purchase, Louis E. Hawes, Tremont Building, Boston. SUPPLY.—Aqua Rex Spring, pumping to stand-pipe. At spring there is a covered reservoir 10 × 25 ft., 5 ft. deep, and an open basin 30 ft. diam. PUMPS.—Cap., 750,000 galls. Deane dup. George's Creek coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 200,000 galls; 20 × 80 ft., iron. DISTRIBUTION.—Services, iron. Meters, 0. Hydrants, public, 18; private, 4. PRESSURE.—50 lbs. FINANCIAL.—Cost, $30,000; paid by town for system. Bonded debt, $28,000. Sinking Fund: $1,800, in savings banks. Expenses: Operating, about $1,200. Sinking fund and interest are met by taxation. MANAGEMENT.—Secy., Treas. and Supt., W. W. Whiting; Ch. Pump. Engr., J. S. Adams. Rept. by Supt., Dec. 28. SEWERS.—None.

P 6. **MILLVILLE,** Worcester Co. (Town of Blackstone, 6,138.) Proposed works to be built by Blackstone Water Co.; legislative authority has been secured. Supply to be by gravity from Ironston Pond.

86. **MILTON,** Norfolk Co. (4,278.) Built in '90 by Milton Water Co., which has since absorbed Brush Hill Water Co., of which it was an extension. SUPPLY.—Hyde Park Water Co.'s system. DISTRIBUTION.—Mains, 18 miles. Hydrants, 150. PRESSURE.—(In '89), 20 to 100 lbs. FINANCIAL.—Cost, $160,000. Cap. Stock: Authorized, $150,000; paid-up, $64,000. Bonded debt: Authorized, $150,000; issued, $60,000. Hydrant rental, $40. MANAGEMENT.—Prest., E. P. Whitney, Blue Hill; Secy., C. S. Raekemann, Readville; Treas., Henry Wainwright, 40 State St., Boston. NOTE.—No report since '90-91 Manual.

143. **MITTINEAGUE,** Hampden Co. Within and supplied by West Springfield.

87. **MONSON,** Hampden Co. (3,650.) Built in '95 by town; put in operation May 1. Engr., F. L. Fuller, 12 Pearl St., Boston. Contr., E. E. Eglee, Flushing, N. Y. SUPPLY.—Well, by gravity. Well is in valley of Ingall's Brook, near junction of latter with Conant Brook, about 2½ miles from and 300 ft. above town; 73 ft. in diam. at top, 23 ft. deep and serves as a distributing reservoir. DISTRIBUTION.—Mains, 9 miles. Taps, 67. Meters are compulsory for all private services. Hydrants, 78. PRESSURE.—Ordinary and fire, 130 lbs. FINANCIAL.—Bonded debt, $58,000. MANAGEMENT.—Supt., J. E. Lockwood. No sewers. Rept. by F. L. Fuller, Jan. 19, '97.

88. **NAHANT,** Essex Co. (880.) Built in '85 by town. SUPPLY.—Marblehead Water Co.'s works, through meter. FISCAL YEAR CLOSED Feb. 28. DISTRIBUTION.—Mains, 8 miles.; cost extensions met by taxation. Taps, 206. Meters, 8. Hydrants, public, 51. PRESSURE.—(In '89.) Ordinary, 70 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $55,000. No debt. Expenses, $4,213; $275 per month is paid to Marblehead Water Co. for water. Revenue, $4,700: Consumers, $3,900; City, $800. Deficits: All expenses are met by revenue except extensions. MANAGEMENT.—Three selectmen, elected every year. Prest., J. T. Wilson; Secy., J. C. Wilson; Supt., R. L. Cochran; Rept. by Supt., June 8. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, June 6, '85.

89. **NANTUCKET,** Nantucket Co. (3,268.) Built in '78 by Wannacomet Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Wannacomet Pond, pumping to tank and direct. Pond has area 8 acres; depth, 14 ft., drainage area, 40 acres; is 6 ft. above ordinary high tide and two miles from town. PUMPS.—Cap., 1,800,000 galls. Worthington, non-comp. high pressure, 1,500,000; Blake, 300,000. Bituminous coal used; av. cost, $4.20 per short ton. FILTERS.—Cap., 200,000 galls. Sand, gravity; area, 4,600 sq. ft.; depth filtering material, 3½ ft. Engr., J. B. Rider, South Norwalk, Conn. Used only occasionally in fall and not every year. For illustrated description of filters, see Eng. News, Apr. 26, '94. TANK.—Cap., 50,760 galls.; ¼-in. iron, 24 × 15 ft., on 27-ft. trestle of 9 c. i. columns. Elev. to top of tank, 104 ft. above tide water. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 8.7 miles; cost extensions met by revenue. Taps, 762; made by Co., free. Services, lead and galv. i.; paid for by Co. to curb, thence by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 88,000; max., 220,000; min., 50,000. Consumption is greatest in July and August. Town is a summer resort. PRESSURE.—Ordinary, 25-37 lbs.; fire, 80 lbs. One steam fire engine is used. FINANCIAL.—Cost, 60,000. Cap. Stock, $36,000, all paid-up. Floating debt, small; Bonded $20,000, at 6%; due 1900. Revenue: Total City, $830: Hydrants, $700; public buildings, $55; fountain, $75. MANAGEMENT.—Prest., R. Gardner Chase; Secy., Treas. and Supt., Wm. F. Codd; Ch. Pump. Engr., Geo. W. Francis. Rept. by Supt., June 6. SEWERS.—None. REFERENCES.—Eng. News, Feb. 25, '82; sand filtration, Apr. 26, Aug. 16, 30, '94.

90. **NATICK,** Middlesex Co. (9,118.) Built in '74 by city. SUPPLY.—Dug Pond, by direct pumping and pumping to reservoir. Pond has area of 44½ acres; cap., about 150,000,000 galls. PUMPS.—Cap., 3,000,000 galls. Worthington, hor. comp. cond., and Blake comp. dup., 1,500,000 each. Force main, 12-in., 12,000 ft. long. RESERVOIR.—Cap., 8,500,000 galls. FISCAL YEAR CLOSED Feb. 28. DISTRIBUTION.—Mains, 28 miles. Taps, 1,388. Meters, 47. Hydrants, 148. CONSUMPTION.—(Galls.) av., 263,830.

FINANCIAL.—Cost, $347,398. Bonded debt, $101,200. Expenses, $4,629: Int., $4,048. Revenue, $18,130. MANAGEMENT.—Three Comrs. NOTE.—No report since 90-91 Manual. REFERENCE.—Eng. News, Sept. 2, '82.

91. **NEEDHAM,** Norfolk Co. (3,035.) Built in '90 by town; put in operation Dec. 10. Engr., Louis E. Hawes, 75 State St., Boston. Contr., Chas. Eglee. SUPPLY.—Well, fed by springs, pumping to stand-pipe. Well is in valley of Colburn's Brook, about one mile from village; 22 x 24 ft.; has brick walls and is covered. PUMPS.—Cap., 1,500,000 galls. Two Blake, comp. dup. direct acting, 750,000 each. George's Creek, Cumberland coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 301,000 galls.; iron, roofed, 25 x 85 ft., on masonry foundation. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 23 miles; cost extensions met by bonds. Taps, 534; made by dept. Services, lead and cem.-lined iron; paid for by owner of property. Meters: 253; owned by consumer; controlled by dept.; repairs paid by consumer. Use of meter optional with consumer until the close of the last fiscal year; since then compulsory for all consumers. Hydrants, public, 181. CONSUMPTION.—(Galls.) av., 139,099; max., 250,000; min., 90,000. PRESSURE.—Ordinary, 75 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $144,620. Bonded debt, $138,000, at 4%. Expenses: Operating, $2,604; int., $5,574. Revenue: Consumers, unmetered, $2,023; metered, $3,166; City, fire protection, $4,450. Deficits are charged to the fire department and amount is raised by taxation. MANAGEMENT.—Chn., E. G. Pond; Clk. and Supt., Geo. A. Adams; Town Treas., Levi Ladd; Ch. Pump. Engr., Chas. H. Mitchell. Rept. by Supt., June 6. SEWERS.—None. REFERENCE.—Yield of springs, Eng. News, Sept. 3, '96, illus.

92. **NEW BEDFORD,** Bristol Co. (40,733.) Built in '66-9 by city. SUPPLY.—Acushnet River and Little Quittacus Pond, by gravity from storage reservoir to city, thence by pumping to distributing reservoir and stand-pipe. PUMPS.—Cap., 15,000,000 galls. McAlpine, 6,000,000; two Worthington, comp. cond., 4,000,000, and hor. comp. high duty, 5,000,000, respectively. Coal used: Bituminous, Pocahontas, New River and George's Creek; av. cost, $3.41; Anthracite, Pea; av. cost, $4 per short ton. Wood, $4 per cord. RESERVOIRS.—Cap., 418,000,000 galls.: Storage, 400,000,000; Receiving, 3,000,000; Distributing, 15,000,000; 124 ft. above pump-well and 154 ft. above tide-level. STAND-PIPE.—Cap., 6,300 galls.; 5 x 43 ft.; abandoned. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 76 miles. Taps, 8,027; made by city for $2, including service to curb. Services, lead; paid for by consumer from curb. Meters, 254; owned partly by city and consumer; controlled and repaired by city. Use of meters compulsory for factories and wasters. Hydrants, public, 624. CONSUMPTION.—(Galls.) av., 4,711,866; max., 8,498,596; min., 2,870,521. PRESSURE.—Ordinary and fire, 4-63 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,661,509. Bonded debt, $620,000, at (av.) 5.17%. Sinking Fund: $18,506. Expenses: Operating, $34,295; int., $35,600. Total Revenue, $98,270: Consumers, unmetered, $86,030; misc., $120; City, $12,000. Deficit, $13,600, met by appropriation from tax levy. MANAGEMENT.—Mayor, David L. Parker; Clk. and Supt., R. C. P. Coggeshall; Water Regr., Jas. H. Hathaway; Ch. Pump Engr., Adoniram S. Negus. Rept. by Supt., July 14. PROJECTED IMPROVEMENTS.—Jan. 5, '97, Supt. sent description of improvements, which is summarized as follows: Dam at outlet of Great Quittacus Pond, increasing cap. of this and Little Quittacus Pond; 6-ft. masonry conduit connecting two ponds; two 10,000,000-gall. Leavitt pumps at Little Quittacus Pond; force main, 48-in., steel, 8 miles long; 68,000,000-gall. reservoir on High Hill, 216 ft. above tide and 62 ft. above present distributing reservoir; 36-in. c. i. supply main from reservoir. Force and supply main and reservoir are finished, but it will take fully a year to complete balance. Engrs., Geo. S. Rice and Geo. E. Evans, 95 Milk St., Boston. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News: General description, Aug. 13, '81; Worthington pump, June 26, '86; water waste, Oct. 24, '95; Acushmet River dam, June 21, '90.

93. **NEWBURYPORT,** Essex Co. (13,947.) Owned by city since Feb. 1, '95. Built in '81 by Newburyport Water Co. SUPPLY.—Springs and wells, pumping to tank. PUMPS.—Cap., 3,500,000 galls. Two Curtis comp. dup., 2,000,000 and 1,500,000. Cumberland coal used; av. cost, $3.60 per short ton. RESERVOIRS.—Cap., 3,500,000 galls. STAND-PIPE.—Cap., 335,000 galls.; iron, open, 40 x 85 ft.; top 155 ft. above tide-level. FISCAL YEAR CLOSED Jan. 14. DISTRIBUTION.—Mains, 29 miles. Taps, 2,393; made by city, free. Services, w. i. cement-lined; paid for by city to street line, thence by consumer. Meters: 40; owned by city and consumer; yearly rental, 10% of cost. Use of meters optional with city. Hydrants, public, 174; private, 4. CONSUMPTION.—(Galls.) av., 664,715. PRESSURE.—Ordinary, 40 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $351,617. Cap. Stock: Authorized, $300,000; all paid-up. MANAGEMENT.—Prest., Chas. C. Dame; Secy., A. W. Greenleaf; Supt., Wm. H. Lawrence. Rept. June 8. SEWERS.—Has sanitary and partial storm sewers. REFERENCE.—Eng. News, May 30, '85.

94. **NEWTON,** Middlesex Co. (24,379.) Built in '76 by city. SUPPLY.—Ground water, intercepted on its way to Charles River by conduits, pumping to reservoir from filter basin. Filter basin, 1,575 ft. long, 70 to 88 ft. wide, with driven wells in bottom and across river, and 2,000 ft. of 48-in. collecting conduit formerly reported as in use. PUMPS.—Cap., 10,000,000 galls. Blake, cross comp., 5,000,000; Worthington, old style, comp. dup., 5,000,000. George's Creek, Cumberland coal used; av. cost, $3.82 per short

ton. RESERVOIRS.—Cap., 17,000,000 galls. Two distributing, 14,500,000 and 2,500,000. The latter, which is covered with brick arches, gives the greatest pressure by about 25 lbs. and is used almost exclusively. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 120 miles; cost extensions met by bonds. Taps, 5,917; made by city, free. Services, lead and galv. i.; paid for by city to street line, thence by consumer. Meters: 4,580; owned by city, 3,600; consumer, 980; controlled and repaired by city; yearly rental, $2 and upwards. Use of meters compulsory for those consumers having more than one faucet; with certain fixtures use of meters has been compulsory for nine years. City can compel the use of meters and any consumer may have one. Hydrants, public, 805; private, 20. CONSUMPTION.—(Galls.) av., 1,801,000; max., 3,005,000; min., 1,033,800. PRESSURE.—Ordinary, av., 84 lbs.; varies from 10-120 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,887,000. Bonded debt, $1,885,000: $600,000, at 6%, due 1905; $250,000, at 5%, due 1906; $1,035,000, at 4%, due 1910-1925. Sinking Fund: $557,000, invested in city bonds at 4%. Expenses, $103,787: Operating, $16,000; int., $87,500; taxes, $287. Revenue, $101,083: Consumers, unmetered, $8,000; metered, $73,900; City, fire protection, $14,600; street sprinkling, $2,550; sewer flushing, $0; public buildings, $983; watering troughs, $1,050. Deficit of $60,372 (for sinking fund ?) met by general taxation. MANAGEMENT.—Prest., Hon. Wm. P. Ellison; Clk., J. C. Whitney, West Newton; Supt., H. N. Hyde; Ch. Pump. Engr., Thos. Coughlan. Rept. by Clk., June 16. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary sewers and storm drains. REFERENCES.—Eng. News, Aug. 6, '81; Blake pumps, Feb. 9, '93, illus.

95. **NORTH ADAMS,** Berkshire Co. (16,074.) Built in '65 by fire district. SUPPLY.—Brook and artesian wells, by gravity from brook and pumping from wells. Brook has drainage area of 2.46 sq. miles. PUMPS.—Cap., 2,400,000 galls. Knowles. RESERVOIRS.—Three; cap., 100,000, 750,000 and 10,000,000 galls., collecting, settling and distributing, respectively. New dam completed in '96 impounds 90,000,000 galls.; (press rept.) Engr., D. M. Greene, Troy, N. Y.; Contr., for finishing work, Donato Cuozzo, New York city; first part of work done by day's labor. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 50 miles. Taps, 3,000. Meters: 40. Hydrants, 200. CONSUMPTION.—(Galls.) av., 2,500,000. FINANCIAL.—Total Bonded debt, $472,250. Expenses: Operating, $10,803; int., $16,062. Revenue: Consumers, $40,000. MANAGEMENT.—Bd. of Pub. Wks.; City Treas., Jas. W. Hardenbergh; Supt., Wm. F. Hodge. Rept. by City Treas., Dec. 26. REFERENCE.—Eng. News, Sept. 23, '82.

96. **NORTHAMPTON,** Hampshire Co. (14,990.) Supplies villages of Florence and Leeds on pipe line. Built in '71 by city. SUPPLY.—Mountain streams, by gravity. RESERVOIRS.—Cap., 104,500,000 galls. Three storage, 4,000,000, 16,500,000 and 84,000,000. Latter built in '94, on Roberts' Meadow Brook, between other two; area, 26 acres; max. depth, 30 ft.; av. depth, 9.9 ft. Supply main (in '89), 2¼ miles 16, 2½ miles 12-in. c. i.; head, 244 ft.; dy. cap., 2,350,000 galls. Press rept., July, '95, stated that pipe had been bought for new 24-in. main for part of distance, to be extended balance of way later. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 51 miles. Taps, 2,700; made by city at cost. Services, galv. i. Meters: 33; owned, controlled and repaired by city. Use of meters optional with city; compulsory for manufacturers, hotels and saloons. Hydrants, public, 244; private, 8. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 40-120 lbs. Steam fire engines are used. FINANCIAL.—Cost, $433,688. Debt, $198,000: Bonded, at 4%; $48,000, due '96-7, 8 and 9; $50,000, due 1900; $100,000, due 1909. Expenses: Operating, $3,268; int., $8,280. Revenue: Consumers, $30,684; City, $2,000. MANAGEMENT.—Prest., C. W. Kinney; Secy., J. A. Sullivan; Treas., O. Edwards; Supt., L. C. Wright. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 13, '81.

P 7. **NORTH ANDOVER,** Essex Co. (3,742.) In '93 town was authorized by legislature to construct works; est. cost, $100,000.

97. **NORTH ATTLEBOROUGH,** Bristol Co. (6,727.) Built in '84 by fire district. SUPPLY.—Well, pumping to stand-pipe. Well is 25 × 30 ft., covered, on Ten Mile River, outlet of Whitings' mill pond. PUMPS.—Cap., 2,500,000 galls. Davidson, 1,000,000 comp. cond.; Deane, 1,500,000 comp. cond. dup. STAND-PIPE.—Cap., 565,000 galls.; iron, covered, 40 × 60 ft. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains (in '91), 12 miles; cost extensions met by taxation. Taps, 785; made by town. Services, lead-lined iron. Meters: 750; owned by property owner; controlled and repaired by town. Use of meters optional with town. Hydrants, public, 160. CONSUMPTION.—(Galls.) av., 183,479. PRESSURE.—Ordinary, 76 lbs. FINANCIAL.—Cost, $195,982. Bonded debt, $175,000, at 4%. Sinking Fund: $56,569. Expenses: Operating, $4,915. MANAGEMENT.—Prest., J. F. Makinson; Secy., G. K. Webster; Supt., W. P. Whittemore; Ch. Pump. Engr., C. W. Whittemore. Rept. by Supt., June 6.

P 8. **NORTH BILLERICA,** Middlesex Co. (Town of Billerica, 2,380.) Com. appointed in '96 to investigate introduction of supply. Engr., Percy M. Blake, Hyde Park. Rept. by Chn. Com., Aug. 15. Probably action will be taken, Mar., '97.

98. **NORTHBOROUGH,** Worcester Co. (1,952.) Built in '82 by town. SUPPLY.—West branch of Cold Harbor Brook, by gravity from impounding reservoir. RESERVOIR.—Cap., 30,000,000 galls.; area, 9 acres; drainage area, 2¼ sq. miles; 3 miles

from and 180 ft. above, village. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—(In '90.) Mains, 9½ miles. Taps, 244. Hydrants, 51. FINANCIAL.—Cost (in '90), $70,006. Bonded debt (in '90), $61,500, at 4%; due in 1912. Sinking Fund: (In '90), $18,500. Expenses: Operating, $195; int., $2,460. Revenue, $3,544. MANAGEMENT.—Three Comrs. REFERENCE.—Eng. News, Jan. 20, '83.

99. **NORTH BROOKFIELD,** Worcester Co. (3,871.) Built in '92 by town. Put in operation Jan. 1 '93. Engrs., Shedd and Sarle, Chas. A. Allen, Worcester. Contrs., John E. McLellan, Grafton, Thos. Hennessey, Jeffersonville. SUPPLY.—Doane Pond, pumping to reservoir, which may be supplemented by water from North (or Horse) Pond and North Brook, although latter is designed to furnish water for power, only, unless in case of emergency. Total drainage area, excluding 100½ acres of water surface, 1,507.7 acres. PUMPS.—Cap., 1,000,000 galls.; Knowles duplex, water power; also auxiliary steam plant. Water power 52 ft. fall. Force main, 12-in. FILTER WELL.—In pond; two concentric masonry walls with annular space 5 ft. wide, 17½ ft., internal, 22½ ft. external diameter, filled with sand and gravel. Walls laid dry to within 3 ft. of high water line. Suction well within inner wall. Water can get to suction well only by passing through filter, or greater distance through gravel at bottom of pond. Water is also aerated by fountain in distributing reservoir. RESERVOIRS.—Cap., 407,200,000 galls. Storage, 1½ miles from town: North Pond, 350,000,000; area, 69.6 acres. Doane Pond, 54,000,000; area, 30.9 acres. Bell Hill distributing: 3,200,000; ½ mile from centre of town, 170 ft. above the main street; 16 ft. deep, rectangular, inner slopes paved. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions formerly met by town notes, hereafter from water revenue. Taps, 349; made by town free of charge. Services, cem. lined w. i.; paid for by town to curb line, thence by consumer. Meters: 3; owned, controlled and repaired by town; yearly rental, 10% of cost. Use of meters optional with town; compulsory for laundries, grist mill and R. R. Station. Hydrants, public, 92. CONSUMPTION.—(Galls.) av., 90,319; max., 145,000; min., 42,000. PRESSURE.—Ordinary, 85 lbs. Steam fire engines are used. FINANCIAL.—Cost, $180,428. Debt, $130,000 in 3½% town notes; $10,000 paid each year by taxation. Expenses: Operating, $2,795; int., $5,550. Revenue: Consumers, unmetered, $6,000; metered, $200; City, fire protection, $2,775. MANAGEMENT.—Prest., Theodore C. Bates, Worcester; Secy., Francis Batcheller; Treas., Geo. R. Hamant; Supt. and Ch. Pump. Engr., John R. Southworth. Rept. by Francis Batcheller, Aug. 20, and Edw. W. Shedd, Worcester, July 1. PROJECTED IMPROVEMENTS.—$2,000 to be expended this season in strengthening storage dam. SEWERS.—Partial sanitary and storm sewers. REFERENCE.—Aerating fountains, Eng. News, Aug. 16, '94.

100. **NORTH EASTON,** Bristol Co. (Town of Easton, 4,493.) Built in '87-8 by North Easton fire district. SUPPLY.—Collecting well, spring and collecting pipes, pumping to stand-pipe and direct. Well 27 × 28 ft., near Queset River; covered and ventilated. Lincoln Spring connected with well. Collecting pipes are 5 ft. beneath bottom of the 5,000,000 reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. cond. Force main (in '89) 10-in. RESERVOIRS.—Two. One has cap. of 5,000,000 galls.; 6 ft. deep, above collecting pipes. Other is smaller; first filled Dec., '91. STAND-PIPE.—Cap., 235,000 galls.; covered, 20 × 106 ft., high water 3 ft. from top; on masonry foundation; 10-in. supply pipe, 90 ft. high, in center. DISTRIBUTION.—Mains, 6.5 miles. Taps, 240. Meters, 9. Hydrants, 60. FINANCIAL.—Cost, $78,000. Bonded debt, $75,000 at 6%. Expenses, $4,300: Operating, $1,300; int., $3,000. Revenue, consumers, $4,260. NOTE.—No report since '90-1 Manual, and figures under Distribution and Financial are for '88.

D 4. NORTH FALMOUTH, Barnstable Co. (Town of Falmouth, 2,567.) North Falmouth Water Supply Co. built domestic works about '93, pumping to tank. Address Chas. Sprague.

D 5. NORTHFIELD, Franklin Co. (1,869.) Built in '05 by Northfield Aqueduct Co. Supply, Brooks, by gravity. Mains, 1¼ miles. Taps, 12. No report since '90-1 Manual.

44. NORTH GRAFTON, Worcester Co. Supply from Grafton.

D 6, P 9. NORTON, Bristol Co. (1,785.) Domestic works built in '95 by A. H. Sweet; Engr., Wm. H. Luther, Attleboro. Contr., N. Perry Co., Attleboro. Supply, driven well, pumping to tanks. Knowles pumps. Tanks, cap., 60,000 galls.; two, one 10,000 on 40.-ft. trestle and one 50,000, raised only a few feet above ground. Mains, 1 mile. In '95, legislative authority was granted for formation of Norton fire district and establishment of works by it. It may buy water of or sell water to town of Attleboro or Mansfield water supply district. Rept. by A. H. Sweet, Aug. 17.

101. **NORWOOD,** Norfolk Co. (3,733.) Built in '85-6 by town. SUPPLY.—Buckmaster Pond in Dedham, pumping to reservoir. Pond fed by springs; cap., 123,000,000 galls.; area, 29½ acres; drainage area, about 250 acres. Depth: Max., 29 ft.; av., 18 ft. PUMPS.—Cap., 2,000,000 galls.; two 1,000,000 Davidson. RESERVOIR.—Cap., 1,400,000 galls.; bottom covered with concrete. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 16 miles. Taps, 478. Meters: 114. Hydrants, 103. CONSUMPTION.—(Galls.) av., 169,000. FINANCIAL.—Cost, $123,957. Bonded debt, $90,000, at 4%. Sinking Fund: $8,408. Expenses, $2,213: Int., $3,600. Revenue, $7,051. MANAGEMENT.—Comrs. NOTE.—No rept. since '90-1 Manual.

102. **ONSET,** Plymouth Co. (Town of Wareham, 3,451.) Built in '94 by Onset Water Co.; put in operation in July. Onset is in town of Wareham. Des. Engr., Freeman C. Coffin, Boston. Contr., Jas. J. Newman, Providence, R. I. FRANCHISE.—Perpetual; provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental. No legal difficulties. SUPPLY.—Sand Pond, pumping to stand-pipe. (Pond also known as Sturtevant's and as Jonathan's.) PUMPS.—Cap., 300,000 galls. Snow dup. Bituminous, Cumberland coal used; av. cost, $4.75 per short ton. STAND-PIPE.—Cap., 94,000 galls.; steel, 20 × 40 ft., on 63-ft. yellow pine trestle. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 7 miles; cost extensions met by sale of new stock and bonds. Taps, 200; made by Co., free, "except in special cases requiring Co.'s supervision." Services, galv. i.; paid for by Co. to street line. Meters, 0. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 8,000; max., 40,000; min., 5,000. Largest consumption in July and Aug., summer resort and no manufacturing. PRESSURE.—Ordinary, 57 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $38,636. Cap. Stock: Authorized, $35,000; paid-up, $20,000. Floating debt, $5,631; Bonded, $20,000, at 6%; due 1915. Expenses: Int., $1,275; taxes, $335. Revenue: City, fire protection, $1,000. MANAGEMENT.—Prest., J. K. Nye, Fairhaven; Treas., E. D. Eldredge, Brookline; Supt. and Ch. Pump. Engr., L. E. Rice. Rept. by Treas., Sept. 29. SEWERS.—None.

103. **ORANGE,** Franklin Co. (4,568.) Present works built in '93 by town; put in operation Aug. 14. Engrs., Shedd & Sarle, Worcester. Contrs., Gennaro, Long & Little, Boston. In '75 New Home Sewing Machine Co. built works for domestic supply only, which in '90 comprised about 2 miles of mains and 100 taps; supply being by gravity from spring and pumping from Miller's River, in dry weather. SUPPLY.—Mountain brook, with large spring as an additional supply, pumping by water power to reservoirs and a steam plant which is seldom used, as an auxiliary. Total drainage area, including water surface, 2.16 sq. miles, of which ⅝ sq. miles is tributary to North Pond, designed only for power purposes, unless emergencies arise. PUMPS.—Deane; 1,000,000 dup. water power and steam comp. dup. FILTERS.—Provision for natural filters if found necessary. RESERVOIRS.—Cap., 362,228,000 galls. North Pond, for power, 357,000,000; Collecting, 2,045,000; Power reservoir, near station, 1,058,000; Distributing, on Walnut Hill, 2,125,000; Crystal Spring reservoir, 600,000, for the auxiliary supply. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 11 miles. Cost extensions met by town. Taps, 348; made by town, no fee. Services, ¾-in. galv. i., paid for by town to property line, thence by consumer. Meters, 114; owned by consumer; controlled and repairs paid by town. Town can compel use of meters and any consumer may have one. Hydrants, public, 97; private, 36. CONSUMPTION.—(Galls.) av., 137,502; max., 188,430; min., 96,753. PRESSURE.—Ordinary, 82 to 131 lbs. Steam fire engines are used. FINANCIAL.—Cost, $154,057. Bonded debt,, $137,000, at 4%. Sinking Fund; $8,695. Expenses: Operating, $2,507. Revenue, $8,485: Consumers, $4,235; City, fire protection, $4,000; public buildings, $250. Deficits are met by appropriation. MANAGEMENT.—Town Treas., T. Wesley Bridge; Supt., Nicholas Laux. Rept. by Edw. W. Shedd, of Shedd & Sarle, July. SEWERS.—Has sanitary sewers.

104. **PALMER,** Hampden Co. (6,520.) Built in '86 by Palmer Water Co. SUPPLY.—Springs, by gravity from storage to distributing reservoir, thence by gravity to village. RESERVOIRS.—Cap., 8,000,000 galls.; storage, 6,000,000; distributing, 2,000,000; depth, 4 to 5 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 6 miles. Taps, 190. Meters: 5. Hydrants, 47. PRESSURE.—70 lbs. FINANCIAL.—Cost, $42,642. Cap. Stock: Authorized, $20,000; all paid-up. Bonded debt, $20,000, at 5%. Expenses, $2,417: Operating, $1,200; int., $1,000; taxes, $217. Revenue, $4,500: Consumers, unmetered, $3,560; City, $940. MANAGEMENT.—Prest., C. S. Goodhue, Springfield. NOTE.—No rept. since '90-1 Manual.

105. **PEABODY,** Essex Co. (10,158.) Purchased by town in '73 for $125,000; see Salem and Danvers. Built in 1799 by Salem & Danvers Aqueduct Co. SUPPLY.—Spring and Brown's Ponds, pumping through mains to stand-pipe. Drainage area, 550 acres. PUMPS.—Cap., 2,000,000 galls.; Worthington, comp. cond. Cumberland coal used; av. cost, $3.73 per short ton. TANK.—Cap., 524,000 galls ; iron, 60 × 25 ft. FISCAL YEAR CLOSED Jan. 15. DISTRIBUTION.—Mains, 32 miles; cost extensions met by appropriations direct from town. Taps, (in '90), 1,617. Services, galv. i.; paid for by town to street line. Meters, 2; owned, controlled and repaired by town. Use of meters compulsory for two shops. Town can compel the use of meters and "no rule against any" consumer having one. Hydrants, public, 227. CONSUMPTION.—(Galls.) av., 906,475; max., 1,021,776; min., 803,514. PRESSURE.—Ordinary, 75 lbs.; fire, 85 lbs. Steam fire engines are used. FINANCIAL.—Cost, $320,730. Bonded debt, $100,000 at 4%; due $15,000 in '97; $85,000 in 1911. Sinking Fund: $28,667, invested in securities at varying rates of interest. Expenses: Operating, $6,135; int., $12,829. Revenue: Consumers, $22,693. Deficits are met by general taxation. MANAGEMENT.—Water Bd., E. G. Kelley, D. S. Littlefield, A. N. Jacobs. Chn., Elbridge G. Kelley; Clk., Henry Baetje; Supt., Andrew N. Jacobs. Rept. by Clk., June 8. REFERENCE.—Eng. News, Oct. 20, '83.

106. **PITTSFIELD,** Berkshire Co. (17,281.) Built in '55 by fire district. In '91 town become city and fire district was abolished. SUPPLY.—Ashley Lake and Ashley, Sackett and Hathaway brooks, by gravity to distributing reservoirs. Lake drawn on for about

one-third of year, brooks being sufficient balance of time. Drainage area, est., 9 to 10 sq. miles. PUMPS.—Cap., not given. Cameron; for emergency only. RESERVOIRS.—Cap., 258,000,000 galls. Storage, 250,000,000; 4—2,000,000 distributing. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 45 miles; cost extensions met by direct tax or loan. Taps, 3,500; made by city at cost. Services, galv. i.; paid for by consumer. Meters: 50; owned, controlled and repaired by city. Use of meters optional with city; compulsory for business blocks and mills. Hydrants, public, 175; private, 27. CONSUMPTION.—(Galls.) av., 1,700,000. Pressure.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $411,280. Expenses, $18,736: Operating, $6,792; int., $11,944. Revenue, $40,450. MANAGEMENT.—Chn., E. D. Jones; Clk., A. N. French; Supt., J. M. Hatch. Rept. by Clk., June 5. PROJECTED IMPROVEMENTS.—Additional brooks as sources of supply if legislative authority can be obtained. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Oct. 15, '81.

107. **PLYMOUTH,** Plymouth Co. (7,314.) Present works built in '55 by town. Old works built in 1796 by Joshua Thomas and associates. SUPPLY.—Great, Little South, Boot and Lout Pond, by gravity for low service and pumping for high service. Area of ponds, 275, 125, 40 and 60 acres, respectively; total, 500 acres. Two supply mains, w. i. and cem., 7,300 ft. long, one 10-in., one 16-in. PUMPS.—Cap., 1,440,000 galls. Worthington comp. cond. Bituminous coal used; av. cost, $3.78 per short ton. RESERVOIRS.—Cap., 3,000,000 galls. High service, 1,400,000, 105 ft. above tide; low service, 1,600,000, 165 ft. above tide. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 34 miles; cost extensions met by receipts. Taps, 1,620; made by town. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 90; private, 16. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $252,112. Bonded debt, $103,160, at 4%; $5,140 paid off yearly. Expenses, $9,382: Operating, $5,106; int., $4,276. Revenue, $18,234: Consumers, unmetered, $17,714; misc., $520; City, none. MANAGEMENT.—Prest., E. F. Sherman; Secy., H. P. Bailey; Treas., Geo. S. Dyer; Supt., R. W. Bagnell; Ch. Pump. Engr., W. A. H. Jones. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 12, '81.

108. **PROVINCETOWN,** Barnstable Co. (4,642.) Built in '93 by town; put in operation Sept. 25. Engr., Louis Hawes, 75 State St., Boston. Contr., Lucian A. Taylor, Boston. SUPPLY.—Driven wells, pumping to stand-pipe. Water in this vicinity on Cape Cod is in some places, irregularly located, impregnated with marsh gas. To avoid trouble from this source by drawing in such water at times of heavy pumping, water is aerated. PUMPS.—Cap., not given; Blake comp. dup. Force main, 12-in. George's Creek Cumberland coal used; av. cost, $5.20 per short ton. STAND-PIPE.—Cap., 460,000 galls.; 28 × 100 ft., iron, ⅞ to ¼-in. plates, with angle iron at top and another 14 ft. below, also three sets of internal guys; covered with conical wooden roof. Force main is carried to top of stand-pipe and provided with wide flange, over which water passes in thin sheet for aeration. Foundation, granite on concrete. Contr., E. Hodge & Co., East Boston. High water 163 ft. above street at town hall and 175 above mean sea level. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by appropriations. Taps, 484; made by town. Services, iron, cement lined, paid for by consumer to curb. Meters, 41; owned, controlled and repaired by town. Use of meters optional with consumer. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 80,000; max., 115,000; min., 46,000. During summer months a large amount of water is used for flushing mains. PRESSURE.—Ordinary, 70 lbs.; fire, 125 lbs. Steam fire engines are used. FINANCIAL.—Cost, $71,000. Bonded debt: At close of '93, $60,000, due $2,000 yearly, in June 1, besides which there was $10,000 of notes which it was proposed to fund soon. Expenses, Operating, $3,700. MANAGEMENT.—Prest., L. U. Paine; Secy. and Supt., J. D. Adams. Rept. by Supt., Aug. 16. SEWERS.—None.

109. **QUINCY,** Norfolk Co. (16,723.) Works purchased by city in '92. Built in '84 by Quincy Water Co. In Dec., '96, city voted to enter Metropolitan Water Supply System, but up to Jan. 17, '97, formalities had not been completed. See Boston. SUPPLY.—Two wells in gravel bed and storage reservoir on Town brook, pumping to stand-pipe. One well 32 × 27 ft., other 30 × 22 ft. Filter bed described in '88 Manual not in use for some years past. PUMPS.—Cap., 4,000,000 galls. Two Deane comp. cond. and high duty, 2,000,000 each. Cumberland coal used; av. cost., $4.40 per short ton, delivered. RESERVOIRS.—Cap., 180,000,000 galls. In Braintree; area, 47 acres; drainage area, 991 acres of sparsely settled land, little tilled. Supply main, 12-in. STAND-PIPE.—Cap., 422,000 galls.; iron, 35 × 60 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 63 miles; cost extensions met by bonds. Taps, 2,560; made by city, free. Services, lead; paid for by city to street line, thence by consumer. Meters: 100; owned by consumer; controlled by city. Use of meters compulsory for manufacturing purposes. City can compel use of meters and any consumer may have one. Hydrants, public, 332. CONSUMPTION.—(Galls.) av., 904,152; max., 1,668,482; min., 625,766. PRESSURE.—Ordinary, 80 lbs. One steam fire engine is used. FINANCIAL.—Cost, $775,000. Bonded debt, $725,000, at 4%. Expenses: Operating, $14,258; int., about $29,000. Revenue, Consumers, $50,000. MANAGEMENT.—Comrs. Prest., N. G. A. Pattee; Secy., J. H. Stetson; Ch. Pump. Engr., E. T. Spear. Rept. by Supt., J. T. Cavanagh, June 8. PROJECTED IMPROVEMENTS.—NOTE.—See Metropolitan Water Supply, under Boston. SEWERS.—None. REFERENCE.—Eng. News, Sept. 6, '84.

110. **RANDOLPH,** Norfolk Co. (3,946.) Built in '87-8 by town. Pumping station owned and operated jointly by Randolph and Holbrook. See Holbrook. DISTRIBUTION.—Mains, 11 miles. Taps, 446. Meters, 0. Hydrants, 119. PRESSURE.—80 lbs. FINANCIAL.—See Holbrook. Bonded debt, $115,000, at 4%. Sinking Fund, $14,524. Expenses, $10,729. Revenue, Consumers, $4,525. MANAGEMENT.—Comrs. NOTE.—No rept. since '90-1 Manual.

111. **READING,** Middlesex Co. (4,088.) Built in '90-1 by town; put in operation Feb. 22. SUPPLY.—Filter gallery, pumping to stand-pipe. Gallery 3½ ft. wide, 4 ft. high, L-shaped; total length, 250 ft.; depth of bottom below natural surface, 22 ft. PUMPS.—Cap., 1,200,000 galls.; two Blake, 600,000 each. In addition, 1,500,000 comp. non-cond. Worthington rept. by maker (possibly for filter plant). George's Creek, Cumberland coal used; av. cost, $4 per short ton. FILTERS.—Cap., 1,000,000 galls. Warren, gravity, for removal of iron; aeration, lime and alum used. See Eng. News, Nov. 26, '96, for detailed description of filters and filter gallery. STAND-PIPE.—Cap.,530,000 galls.; iron, 30 × 100 ft., on masonry foundation 7 ft. thick; Contrs., E. Hodge & Co., East Boston. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 20 miles. Taps, 753; made by town, free. Services, lead-lined iron; paid for by town to street line, thence by consumer. Meters: 87; owned and controlled by town; repairs paid by consumer. Town can compel use of meters and any consumer may have one. Will probably adopt meter system throughout. Hydrants, public, 111; private, 1. CONSUMPTION.—(Galls.) av., 198,289; max., 945,563; min., 117,180. PRESSURE.—Ordinary, 65-78 lbs. Steam fire engines are only used for long lines of hose. FINANCIAL.—Cost, $197,151. Bonded debt, $195,000, at 4%;due $5,000 each year. Expenses: Operating, $4,919; int., $8,000. Revenue: Consumers, unmetered, $5,764; metered, $934; City, fire protection, $3,300. MANAGEMENT.—Prest., Edw. C. Nichols; Secy., Geo. E. Abbott; Supt., Lewis M. Bancroft; Ch. Pump. Engr., Frank F. Strout. Rept. by Supt., June 5. SEWERS.—None. REFERENCE.—Eng. News, Nov. 26, '96.

112. **REVERE AND WINTHROP,** Suffolk Co. (Revere, 5,668; Winthrop, 2,726.) Built in '84 by Revere Water Co. FRANCHISE.—20 yrs. from '85. Does not provide for purchase of works nor regulation of rates by city. Co. is not exempt from local taxes. City to pay $50 per annum for 90 hydrants; $40 per annum for additional ones. SUPPLY.—Open and driven wells in Revere and Saugus, pumping through mains to reservoir. One well, 30 × 20 ft., with three 6-in. and two 2-in. wells in bottom; another well, 40 × 20 ft., with 8 × 30-ft. well sunk in bottom and eight 2-in. wells driven around smaller one. Aside from those already described, there were, in '95, 67 driven wells. PUMPS.—Cap., 3,000,000 galls. Knowles, Deane and Blake, 1,000,000 each. George's Creek, Cumberland coal used; av. cost, $4.00 per short ton. RESERVOIRS.—Cap., 1,250,000 galls.; in Revere. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 51 miles; cost extensions met by income. Taps, 3,000; made by Co. Services, w. i. cement-lined; Co. lays to street line for 25 cts. per ft. Meters: 5; owned and repaired by consumer; controlled by Co. Use of meters optional with Co. Hydrants, public, 176; private, 2. CONSUMPTION.—(Galls.) av., 874,238. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $364,892. Cap. Stock: Authorized, $125,000; paid 7% div'd in '95. Debt, $212,800: Floating, $12,800, at 6%; Bonded, $200,000, at 5%, due 1904. Expenses: Operating, $14,869; int., $11,004; taxes, $1,030. Revenue: Consumers, unmetered, $43,049; metered, $138; City, fire protection, $7,043; street sprinkling, $600; sewer flushing, $270. MANAGEMENT.—Prest., Geo. F. Proctor; Secy. and Supt., A. S. Burnham; Treas., Alfred Birnie; Ch. Pump. Engr., Geo. R. Sackett. Rept. by Supt., June 15. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary sewers only.

F 1. **RICHMOND FURNACE,** Berkshire Co. (Town of Richmond, 796.) Built in '82 by Richmond Iron Works for fire protection. Source, spring, by gravity. One storage reservoir ⅛ acre in area. Hydrants, 6. Prest., Geo. Church; Secy., J. H. C. Church; Treas. and Supt., R. O. Burges. Rept. by H. J. Dresser, Att'y., July 15. REFERENCE.—Eng. News, Dec. 16, '82.

D 7. **RIVERSIDE,** Franklin Co. (Town of Gill, 960.) Owned by Riverside Water Co.; bought from private parties in '89. Supply, Springs by gravity. Mains, 4,000 ft. Taps, 40. Cost, $4,000. Revenue, $500. NOTE.—No rept. since '90-91 Manual.

113. **ROCKLAND,** Plymouth Co. (5,218.) Built in '86 by town; supply system jointly owned with Abington, which see. FISCAL YEAR CLOSED Dec 31. DISTRIBUTION.—Mains, 18 miles. Taps, 801. Meters, 120. Hydrants, 112. CONSUMPTION.—(Galls.) av., 311,827. FINANCIAL.—Cost, $166,067. Expenses, $3,631. Revenue, $7,102. MANAGEMENT.—Comrs. NOTE.—No rept. since '90-1 Manual.

114. **ROCKPORT,** Essex Co. (4,087.) Built in '94 by town. Engrs., E. Worthington & Co., Boston. Contr., E. E. Eglee, Flushing, N. Y. In '93, Rockport Water Co. applied to legislature for charter. Town opposed same before Governor, who finally signed bill after agreement of Co. to transfer it to town for $150; Co. afterwards refused to make transfer and ordered material. Town then voted to buy out Co. Matter went into Courts. In '94 town secured authority to build works and finally compromised with Co., paying it $750. Above abstracted from Rept. Water Comrs. for 1894-5, where controversy is given in detail. SUPPLY.—Cape Pond, pumping to stand-pipe. Area of pond, 40 acres; drainage area, excluding water surface, about 160 acres; 72 ft. above mean tide.

PUMPS.—Cap., 2,000,000 galls.; two 1,000,000 Deane comp. dup. Force main, 10-in. STAND-PIPE.—Cap., 317,000 galls.; 30 × 60 ft.; iron, 7-16 to ⅜-in. plates; roof, wood and slate. Contrs., Cunningham Iron Works Co., South Boston. Foundations, masonry, or rock. Bottom of pipe is 168 ft. above sea level and 94 ft. above pond. DISTRIBUTION.—Mains, 8 miles. Taps, 589. Services paid for by consumer. Use of meters compulsory for large stables and hotels. Hydrants, public, 108. PRESSURE.—Ordinary, 90 lbs. Fire engines are used. FINANCIAL.—Cost, $151,000. Bonded debt, $150,000. Expenses: Operating, $3,714. Revenue: Consumers, $3,825; City, $2,750. MANAGEMENT.—Comrs., G. I. Farr, G. A. Lowe, J. L. Woodfall; Supt., C. A. Wetherbee. Rept. by Supt.

115. **RUTLAND,** Worcester Co. (980.) Built in '96 by town. Engr., D. M. Wheeler, Worcester, Mass. Contr., Lucian A. Taylor, Boston. SUPPLY.—Muschopange Lake, pumping to stand-pipe. PUMPS.—Cap., 288,000 galls.; Knowles. Cumberland coal used; av. cost, $4.75 per short ton. STAND-PIPE.—Cap., 250,000 galls.; iron, 20 × 90 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by loans. Taps, 40; made by town. Services, galv. i.; paid for by town to street line. Meters, 0. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 7,000. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $25,000. Water loan to be paid in 30 years in yearly notes. Deficits, if any, will be met by general taxation. MANAGEMENT.—Prest. and Supt., C. R. Bartlett; Secy. and Treas., W. T. Brown; Ch. Pump. Engr., E. Lawrence. Rept. by Prest. SEWERS.—None.

116. **SALEM,** Essex Co. (30,801.) Present system built in '65-9 by city. First supplied in 1796 by Dan'l Frye from well on Gallows Hill, through wooden pipes. The Salem Aqueduct Co. built works in 1799. The former system continued in existence until '52; the latter plant was sold in '73 to Peabody. SUPPLY.—Wenham Lake, and impounding reservoir on Longham Brook, pumping direct and to reservoir. Lake is 4½ miles from city, 31 ft. above high tide; area, 257 acres; drainage area, 1,716 acres; greatest depth, 49 ft.; fed by springs. Brook has drainage area of 3.3 sq. miles. In '90-1, 30-in. main, nearly 6 miles long, was laid to North Beverly, with 8-in. connections to both the Beverly and Danvers plants. Early in '95 water was turned into lake from new impounding reservoir, through 4,900 ft. of 36-in. c. i. pipe. Engr. for new reservoir and pipe line, L. A. Taylor, Boston. PUMPS.—Cap., 10,000,000 galls.; two Worthington, low pressure, 5,000,000 each. Force mains (in '89), 30-in. c. i., 5,600 ft. long. Lehigh and Wilkes Barre coal used; av. cost, $4.02 per short ton, teamed three miles. RESERVOIRS.—Cap., 75,000,000 galls. Impounding: 55,000,000; area, 43 acres; max. depth, 8½ ft. Distributing: 20,000,000; North Beverly. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 64 miles; cost extensions met by bonds. Taps, 6,068; made by city, free. Services, galv. i.; paid for by city to street line, thence by consumer. Meters: 146; owned, controlled and repaired by city. Use of meters compulsory for hotels, livery stables and factory. City can compel use of meters and any consumer may have one. Hydrants, public, 416; private, 23. CONSUMPTION.—(Galls.) av., 2,147,437. PRESSURE.—Ordinary, 18 to 62 lbs.; fire, 62 lbs.. Three steam fire engines are used. FINANCIAL.—Cost, $1,809,341. Bonded debt, $699,500. Sinking Fund, $153,516. Expenses: Operating, $28,397. Revenue: Consumers, $59,512; City, no direct allowance, but deficits of about $40,000 are met by taxation. MANAGEMENT.—Wenham Water Board; Prest., John F. Hurley; Clk., A. Augustus Smith; Supt., Henry A. Cook. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—New engines and boilers. SEWERS.—Partial sanitary and storm sewers. REFERENCES.—Eng. News, July 30, '81; Mar. 22, '94.

117. **SAUGUS,** Essex Co. (3,673.) Distributing system built in '78 by city; supply from Lynn, which collects water rates from Saugus and gives rebate of 50%, after deducting hydrant rental. DISTRIBUTION.—Mains, 15 miles. Taps, 607. Services, cem.-lined and galv. i. Hydrants (in '90), 84. PRESSURE.—Ordinary (in '89), 65 lbs. FINANCIAL.—(In '90) Cost, $45,800. Bonded debt, $40,800. Expenses: Int.,$1,632. Revenue, $1,078. MANAGEMENT.—Comrs.

D 8. **SAUNDERSVILLE,** Worcester Co. (Town of Sutton, 3,180.) Built in '90 to supply Saunder's Cotton Mills and few houses. Supply, springs, collected in covered reservoir, by gravity, through 8-in. pipe.

118. **SHARON,** Norfolk Co. (1,643.) Bought by the town Oct. 3, '95. Built in '85 by Sharon Water Co. SUPPLY.—Springs, pumping to stand-pipe. PUMP.—Cap., 400,000 galls. Knowles dup. non-cond. George's Creek Cumberland coal used; av. cost, $5 to $5.30 per short ton. STAND-PIPE.—Cap., 188,000 galls.; 20 × 80 ft.; iron, ⅛ to ⅜-in. plates. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 7 miles; cost extensions met by revenue. Taps, 223; made by town, free. Services, lead; paid for by town to street line, thence by consumer. Meters, 5; owned, controlled and repaired by consumer. Use of meters optional with town. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 45,000; max., 140,000; min., 15,000. PRESSURE.—Ordinary, 35-78 lbs.; fire, 80-100 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $30,000; $20,000, at 4%, due 1905, $20,000, at 6%, due 1906. Expenses: Operating, $1,600. Revenue: Consumers, $3,006; City, fire protection, $1,050; other purposes, $40. MANAGEMENT.—Comrs.: D. W. Pettee, O. H. Green, A. D. Holmes. Rept. by Supt., E. E. Farnham, June 11. SEWERS.—None.

P 10. **SHEFFIELD,** Berkshire Co. (1,954.) Sheffield Water Co., chartered March 16, '95, but does not expect to begin work before spring of '97. Supply, springs. Est. cost, $20,000. Rept. by T. C. Wickwise, Secy., Nov. 11.

D 9. **SHELBURNE FALLS,** Franklin Co. (Town of Shelburne, 1,553.) Built in '84 Covell Aqueduct Co. Rates are not subject to regulation by town and Co. is not exempt from taxation. Town pays $28 for public drinking fountain. Supply, mountain springs, by gravity. Fiscal year closed May 1. Mains, 2½ miles. Cost of extensions met by withholding dividends. Taps, 102, made by Co., free. Services, lead and iron, paid for by consumer. Meters, 0. Consumption, 18,000 galls. Cost, $5,500. Cap. Stock, common, authorized, $10,000; paid-up, $5,500; dividend fiscal year, $2 per share, semi-annually. No debt. Expenses, $83: operating, $50; taxes, $33. Prest., G. G. Merrill; Secy. and Treas., Herbert Newell; Supt., L. T. Covell. Rept. by Supt., June 6. Has partial sanitary sewers.

NOTE.—Supt. states that there are a half dozen other smaller Cos. in town supplying water for domestic purposes. A force pump from the river is used for fire protection and street sprinkling.

119. **SOMERVILLE,** Middlesex Co. (40,152.) Partly supplied as early as '58 from Cambridge; present supply introduced in '68 by city from Mystic water-works, then owned by Charleston, now by Boston. SUPPLY.—Mystic system of Boston water-works, pumped to reservoir, thence by gravity. PUMP.—Cap., 2,000,000; Worthington dup. comp. cond. for high service. STAND-PIPE.—Cap., 528,800 galls.; iron, 30 × 100 ft. for high service. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 72 miles; cost extensions met by earnings. Taps, 8,586; made by city for $15, payable in advance (includes service pipe ?) Services, iron, cement-lined; paid for by owner. Hydrants, public, 655; private, 36. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 45 lbs. low service; 70 lbs. high service. Steam fire engines are used. FINANCIAL.—Cost, $667,977. Bonded debt, $242,000, at 4%; $69,500, at 5%; $10,000, at 5½%. Expenses: Operating, $32,907. Total revenue, collected by city of Boston and paid to Somerville, $89,431; being 50% of gross receipts. No deficits. MANAGEMENT.—Prest., Geo. D. Wemyss; Secy., Frank E. Merrill; Supt., N. Dennett. Ch. Pump. Engr., S. E. Hayden. Rept. by Secy., June 18. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, June 10, '82.

D 10. **SOUTH ASHBURNHAM,** Worcester Co. (Not given.) Supply used for domestic and steam purposes. No fire protection. Lawns and streets are sprinkled. Mains, ¾ mile, 3-in. pipe. Supply, Mill pond. Furnishes water to 12 families and one chair factory. Owner, W. F. Whitney.

9. **SOUTH ATTLEBOROUGH,** Bristol Co. Supply from Attleborough.

120. **SOUTHBRIDGE,** Worcester Co. (7,655.) Built in '80 by Southbridge Water Supply Co. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Springs and surface water, by gravity. RESERVOIRS.—Two distributing and two storage; two of the reservoirs have areas of about 30 acres, each. One was built in '93, and 16 and 12-in. main laid to connect it with one of the old reservoirs. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains (in '90.) 5 miles; cost extensions met by loans and income. Taps, 384; made by Co., free. Services, galv. i.; paid for by owner. Meters: 6; owned, controlled and repaired by Co.; yearly rental, $0. Use of meters compulsory for gas co., hall and steam users. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 47; private, some. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 52-73 lbs. Steam fire engines are used occasionally. FINANCIAL.—Cost, $87,880. Cap. Stock, authorized, $70,000; all paid-up; paid 6% div'd. Floating debt, $11,000, at 4 and 4½%. Expenses: Operating, $1,347; int., $402; taxes, $1,113. Revenue: Consumers, $5,064; City, fire protection, $1,300; street sprinkling, $183; public buildings, $340. MANAGEMENT.—Prest., C. D. Paige; Clk., C. M. Wells; Treas. and Supt., Geo. K. Dresser. Rept. by Supt., June 9. SEWERS.—Has sanitary and storm sewers.

P 11. **SOUTH DEERFIELD,** Franklin Co. (Town of Deerfield, 2,910.) Deerfield Water Co., chartered May 12, '94. Proposed supply from stream. Est. cost, $25,000. Address E. M. Roche.

121. **SOUTH FRAMINGHAM,** Middlesex Co. (Town of Framingham, 9,239.) Built in '85 by Framingham Water Co. South Framingham is the principal village in the town of Framingham. FRANCHISE.—Provides for purchase of works by town at any time, at price fixed by mutual agreement, or arbitration. City to pay $40 per hydrant per annum. SUPPLY.—Filter galleries on shores of Farm Pond, pumping direct. Galleries (in '90) had total length of 450 ft., and were about 48 ins. high and wide, arched over. There is a direct connection with pond and also with Sudbury River reservoirs of Boston water-works. PUMPS.—Cap., 3,000,000 galls.; two Deane comp. dup. 1,500,000 each; one low and one high pressure. George's Creek, Cumberland coal used; av. cost, $3.75 per short ton. STAND-PIPE.—Cap., 750,000 galls.; steel; 40 × 80 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 18 miles; cost extensions met by revenue or loans. Taps, 950; made by Co. at cost. Services, lead or iron; paid for by

Co. to sidewalk, thence by consumer. Meters: 220; owned by consumer; controlled and repaired by Co. at consumer's expense. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 92; private, 6. CONSUMPTION.—(Galls.) av., 360,000; max., 575,000; min., 145,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. Steam fire engines are used on outskirts of the town. FINANCIAL.—Cost (in '90), $266,000. Cap. Stock, authorized, $250,000; paid-up, $145.000. Bonded debt, $145,000, at 4½%. Expenses: Operating, $7,500; int., $8,000; taxes, $562. Revenue: Consumers, unmetered, $10,200; metered, $7,500; City, fire protection, $3,600; street sprinkling, $130; public buildings, $150; drinking troughs, $280. MANAGEMENT.—Prest., Chas. F. Cutler, N. Y. city; Secy., S. A. Phillips; Treas., Geo. E. Cutler; Supt., A. E. Martin. Rept. by Supt., June 8. SEWERS.—Has sanitary and partial storm sewers.

122. **SOUTH HADLEY FALLS,** Hampshire Co. (4,261.) Built in '72 by village. SUPPLY.—Springs, by gravity from impounding and storage reservoir. RESERVOIRS.—Cap., 34,000,000 galls.; 4,000,000 impounding and 30,000,000 storage. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains (in '90), 8½ miles. Taps (in '90), 425; made by district for $10, including service to street line. Services, lead or iron; paid for by consumer from street line. Meters: 10; owned, controlled and repaired by dist.; yearly rental, 10% of cost. Meters compulsory for special cases. Village can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 10. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $110,000. Debt: Notes at 4 and 4½%. Expenses: Int., $3,531; Revenue: Consumers, $5,181. MANAGEMENT.—Prest., Henry E. Gaylord; Secy. and Treas., William R. Hill; Supt., M. L. Barnes. Rept by Secy., July 15. SEWERS.—Partial sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 15, '81.

123. **SPENCER,** Worcester Co. (8,747.) Now owned by city. Built in '83 by Spencer Water Co. Bought by city Jan. 1, '84. SUPPLY.—Shaw's pond, by gravity. Small dam creates pond of 67 acres, 200 ft. above, and 4 miles from, village; drainage area, excluding water surface, 155 acres; about ⅛ of area of pond is less than 10 ft. deep. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 13.3 miles. Taps, 950. Services, iron, cement-lined. Meters, 0. Hydrants, 87. PRESSURE.—Ordinary (in '89), 70 lbs. FINANCIAL.—(In '90.) Cost, $243,000. Bonded debt, $240,000, at 4%; due in 1914. Sinking Fund: $35,166, invested in mortgages and bonds, at 5 and 5½%. Expenses: Operating, $722; int., $9,000. Revenue: Consumers, $17,202. MANAGEMENT.—Comrs.; Supt., Dexter Bullard. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 20, '83.

124. **SPRINGFIELD,** Hampden Co. (44,179.) Present works built in '73-5 by city; first supply introduced in '43 by Chas. Stearns, named in '45 the Springfield Aqueduct Co.; bought by city in '72, now used for the low service supply. SUPPLY.—Surface water, springs and brooks in city for low service (also supplemented from high pressure); Broad and Jabish Brooks in Ludlow and Belchertown for high service, by gravity. (Two Deane comp. dup. pumps reported by makers as sold for use here in '93, but not mentioned on rept. for this book.) Drainage area (in '91), 18½ sq. miles. RESERVOIRS.—Cap., 2,304,762,000 galls. Impounding and storage. Low service: Upper Van Horn, 29,952,000; Lower Van Horn, 73,655,000; Lombard, 8,970,000. High service: Cherry Valley (Ludlow), 2,000,000,000; Knight and Gold (Belchertown), 194,185,000. FISCAL YEAR CLOSED Dec. 10, 95. DISTRIBUTION.—Mains, 124 miles; cost extensions met by receipts. Taps, 7,900; made by water dept. at expense of consumer or owner. Services, tarred and galv. w. i.; paid for by owner. Meters: 2,207; owned by consumer; controlled and repaired by city at consumer's expense. Use of meters compulsory for elevators and motors. City can compel use of meters and any consumer may have one. Hydrants, public, 793; private, 86. CONSUMPTION.—(Galls.) av., 4,638,060. PRESSURE.—Low service, 30-35 lbs.; high service, 100-120 lbs. Steam fire engines are used with low pressure. FINANCIAL.—Cost, $2,016,547. Bonded, $1,625,000: $950,000, at 7%; $200,000, at 6%; $350,000, at 4%; $125,000, at 3½%. Sinking Fund: $159,042, in savings bank at 4%. Expenses: Operating, $18,478; int., $97,750; taxes, $191. Revenue: Consumers, unmetered, $120,636; metered, $53,204; City, fire protection, $15,860; street sprinkling, $4,580; sewer flushing, $500; public buildings, $3,910; other purposes, $1,351. Expenses are all paid from receipts, but $25,000 bonds are paid yearly from tax levy. MANAGEMENT.—Chn., C. L. Goodhue; Clk. and Water Reg., A. R. Hathaway; Supt., J. C. Hancock. Rept. by Clk., June 10. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 30, '81.

125. **STOCKBRIDGE,** Berkshire Co. (2,132.) Built in '62 by Stockbridge Water Co.; greatly enlarged in '92. At first water was furnished only for domestic use. FRANCHISE.—Provides for purchase of works by city at any time, price to be total cost of works, including 7% on each expenditure from its date to date of purchase. Rates are not fixed in franchise nor subject to regulation by city. City to pay $40 for first 25 hydrants and $25 for each additional hydrant per year for 30 years from '94. No legal difficulties. SUPPLY.—Lake Averic, by gravity and pumping direct to mains for fire service and increased pressure; springs and impounding reservoir on Bear Mt. as additional supply. Lake has area of 50 acres; drainage area, 1.75 sq. miles, including lake surface. PUMPS.—Cap., 1,440,000 galls. Blake dup. high pressure. RESERVOIR.—Total cap., not given. Lake Averic, 50 acres. Impounding Reservoir on Bear Mt. Dis-

tributing reservoir cap. 250,000 galls. FISCAL YEAR CLOSED June 27. DISTRIBUTION.—Mains, 9 miles. Taps, 180; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 45. PRESSURE.—Ordinary, 27 lbs.; fire, 80 lbs. FINANCIAL.—Cost, withheld. Cap. Stock: Common, authorized, $7,000; all paid-up. Pref'd, authorized, $23,500; all paid-up. Bonded debt, $30,500, at 5%; due 1913. Expenses, $2,700. Revenue, $4,500. MANAGEMENT.—Prest., D. R. Williams; Secy. and Treas., D. A. Kimball; Supt., John H. Markham, Curtisville. Rept. by Secy., July 14. SEWERS.—None. REFERENCE.—Eng. News, Oct. 29, '81.

133. **STONEHAM,** Middlesex Co. (6,155.) Supply from Wakefield. REFERENCE.—Eng. News, June 21, '84.

126. **STOUGHTON,** Norfolk Co. (4,852.) Bought by city in June, '92 and greatly extended. Built in '86 by John G. Phinney, known later as the Stoughton Water Co. SUPPLY.—Pond and well, pumping to stand-pipe. Well, 25 × 30 ft. Submerged puddle dam, 40 ft. deep, 240 ft. long, reported in '93 as having been thrown across valley below a well smaller than above, then said to be source of supply. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Knowles. Cumberland coal used; av. cost, $4.50 per short ton. FILTERS.—Cap., 1,000,000 galls.; gravel. Mass. State Board of Health Rept. for '93 described filter as 100 ft. sq., with 5 ft. of sand and gravel. STAND-PIPE.—Cap., 262,000 galls.; iron, 30 × 60 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 16 miles; cost extensions met by sale of bonds. Taps, 450; made by town. Services, iron; paid for by town. Meters: 100; owned, controlled and repaired by town. Town can compel use of meters and any consumer may have one. At time of rept. meters were being put on all services. Hydrants, public, 200; private, 7. CONSUMPTION.—(Galls.) av., 240,000; max., 482,000; min., 208,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $230,000. Bonded debt, $223,000, at 4%, due 1 to 28 yrs. MANAGEMENT.—Rept. by Comr., Thos. Blanchard, June 24, '96. SEWERS.—None.

D 11. **SUNDERLAND,** Franklin Co. (663.) Built in '83 by Sunderland Water Co.; franchise neither provides for control of rates nor purchase of works by city, but Co. is exempt from taxation. Supply, springs, by gravity to small reservoir. Can compel the use of meters. Capital stock, authorized, $3,000; all paid-up. Town pays $20 for public service. Secy. and Treas., A. T. Montague. Has storm sewers only. Rept. by Secy., Aug. 1.

127, 128. **SWAMPSCOTT,** Essex Co. (3,198.)

TOWN PLANT.

Built in '83-4 by Marblehead Water Co., of Swampscott. DISTRIBUTION.—Mains, 5 miles. Taps, 425. Meters, 1. Hydrants, 65. NOTE.—No rept. since '90-1 Manual.

MARBLEHEAD WATER CO.

Built in '85; now supplies water to Swampscott and Nahant, each town owning its distribution system. FRANCHISE.—Provides for purchase of works by town. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Driven wells, pumping to stand-pipe. Originally there was a large, open well; driven wells were sunk near this, there being 98 in '91. In '89 a 12-in. supply main led to Swampscott and Nahant and another 12-in. to Nahant. PUMPS.—Cap., 2,500,000 galls.; two 1,250,000 Deane dup. George's Creek, Cumberland coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 436,000 galls.; 26 × 110 ft. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 17 miles. Taps, 900; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters not allowed; optional with Co. Hydrants, public, 96; private, 26. PRESSURE.—Ordinary and fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $200,000. Expenses: Operating, $5,000; int., $6,500; taxes, $269. MANAGEMENT.—Prest., Dr. John F. Garden; Secy. and Treas., Geo. R. Bond; Supt., Kendall Pollard; Ch. Pump. Engr., H. B. Brown. Rept. by Geo. T. Till, Aug. 21, and Supt., June 5. REFERENCE.—Eng. News, Oct. 31, '85.

34. **TAPLEYVILLE,** Essex Co. In town of Danvers, which see.

129. **TAUNTON,** Bristol Co. (25,448.) Built in '76 by city. SUPPLY.— Lakeville Ponds; Elder's Pond, Lakeville, kept full by pumping from Assawompsett Pond; by gravity from Elder's Pond to old pumping station, thence pumping direct. Prior to Apr., '94, supply was ground water, with Taunton River for emergencies, pumping direct. Force main from Assawompsett to Elder's Pond, 6,000 ft. 24-in. c. i.; gravity supply main from Elder's Pond to pumping station, 7 miles 30-in. c. i. Elder's Pond has max. depth of 54½ ft., area of 145 acres, drainage area, 195 acres, excluding water surface; 86 ft. above high tide at Taunton, 72 ft. above sill Taunton River pumping station, 35 ft. above Assawompsett Pond. Assawompsett Pond has area of 2,691 acres, and drainage area of 39.8 sq. miles, exclusive its own water surface and those of Long, Great Quittacus and Elder's Ponds, all tributary to Assawompsett. PUMPS.—Main station: Cap., 6,000,000; 2,000,000 Holly quadruplex, 4,000,000 Holly-Gaskill high duty. Lake station: 5,000,000 Allis. George's Creek, Cumberland coal used; av. cost, $3.22 per short ton. Of a total of 413,000,000 galls. consumed in '95, 324,000,000 was pumped from Assawompsett to Elder's Pond. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 71 miles; cost extensions met by appropriations. Taps, 3,843; made by city, free. Services, cement lined w. i.; paid for by city to street line, balance charged to consumer at 35 cts. per ft. Meters: 1,366; owned by consumer; controlled and repaired by city; use of meters optional with

consumer; except compulsory for manufacturers. Hydrants, public, 610; private, 95. CONSUMPTION.—(Galls.) av., 1,148,390; max., 2,000,000; min., 750,000. PRESSURE.—Ordinary, 55 lbs.; fire, 100 lbs. Steam fire engines are rarely used except outside of pipe limits. FINANCIAL.—Cost, $1,140,523. Bonded debt, $438,000 at 4 and 6% (was) due in '96; $832,700, at 4%. Sinking Fund: $479,869. Expenses: Operating, $20,550; int., $48,003. Revenue: Consumers, unmetered, $21,002; metered, $28,011; City, fire protection, $3,500; street sprinkling, $800; public buildings, $522; repairs, etc., $432. Deficits to the extent of $13,000 towards interest and yearly sinking fund appropriation raised by taxation. MANAGEMENT.—Prest., Henry M. Lovering; Secy. and Supt., Geo. F. Chace. City Treas., E. H. Temple. Ch. Pump. Engr., Edw. L. Redfern. Rept. by Supt., July 15. PROJECTED IMPROVEMENTS.—New pumping engines. SEWERS.—Has sewers. REFERENCES.—Eng. News, Aug. 6, '81; pumps, Dec. 21, '94, Apr. 25, '95; pipe laying over river and dam, June 21, '94.

130. **TURNERS FALLS,** Franklin Co. (Town of Montague, 6,296.) Present works built in '86-7 by fire district; first supplied in '73 by Co. Water is sold to Miller's Falls fire district, both districts, as well as Montague City, being in town of Montague. SUPPLY.—Lake Pleasant, pumping to reservoir. Area of lake, 45 acres; max. depth, 40 ft. PUMPS.—Cap., 1,200,000 galls. Deane comp. dup. cond. Bituminous coal used; av. cost, $5 per short ton. RESERVOIRS.—Cap., 1,270,000 galls. Storage; 281.8 ft. above canal in village. FISCAL YEAR CLOSED May 18. DISTRIBUTION.—Mains, 10 miles; cost extensions met by taxation. Taps, 388; made by consumer. Services, iron; paid for by consumer. Meters: 6; owned and repaired by consumer; controlled by district; yearly rental, 10%. Use of meters, compulsory for manufacturers. District does not at present permit consumers to have meters. Hydrants, public, 50; private, 24. CONSUMPTION.—(Galls.) av., 300,000; max., 361,000; min., 233,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $114,000. Bonded debt, $90,000, at 4%; due 1916. Sinking Fund: $10,000, invested in 4% bonds. Expenses: Operating, $2,823; int., $3,600. Revenue: Consumers, unmetered, $7,226; metered, $324; City, fire protection, $1,000; sewer flushing, $75; other purposes, $4,358. MANAGEMENT.—Chn., L. J. March; Secy., H. I. Bardwell; Treas., E. P. March; Ch. Pump. Engr., S. A. Gould. Rept. by Chn., July 17. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 7, '84.

131. **UXBRIDGE,** Worcester Co. (3,408.) Now owned by town. Built in '80 by Uxbridge Water Co.; bought by town Apr. 11, '90. SUPPLY.—Springs, collected by 550 ft. of drains, by gravity from reservoir. RESERVOIRS.—Two. Cap., 400,000 galls; covered; one 60 × 80 ft. × 10 ft. deep, and one 25 ft. in diam. by 15 ft. deep; 137 ft. above and ½ mile from town. FISCAL YEAR CLOSED Feb. 2. DISTRIBUTION.—Mains, 3 miles. Taps, 119. Meters, 32. Hydrants, 24. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—62 lbs. FINANCIAL.—Cost, $27,500. Bonded debt, $27,500, at 5%; due 1910. Sinking Fund: $945, deposited in bank at 4%. Expenses, operating, $945. Revenue: Consumers, $1,536; City, $720. MANAGEMENT.—Comrs. PROJECTED IMPROVEMENTS.—New source of supply; press repts. state supply from Mendon Pond was recommended in fall of '96 by investigating com., after favorable rept. by Engr., Desmond FitzGerald, Boston, Jan., '97, press rept. states town voted against project. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Sept. 26, '85.

132. **VINEYARD HAVEN,** Dukes Co. (Town of Tisbury, 1,506.) Built in '87 by Vineyard Haven Water Co. SUPPLY.—Tashmoo Springs, pumping to stand-pipe. Springs are collected in covered gallery, on shore of Lake Tashmoo, 38 ft. long, 7 ft. wide, 10 ft. high. PUMPS.—Cap., 2,500,000 (?) galls. 1,000,000 Blake (in '89), 1,500,000 Worthington comp. cond. STAND-PIPE.—Cap., 117,000 galls.; 20 × 50 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 8 miles. Meters, 4. Hydrants, public, 18. FINANCIAL.—Cost, $59,228. Cap. Stock, authorized, $30,000; all paid-up. Debt, $32,868: Floating, $2,901; Bonded, $29,967. MANAGEMENT.—Prest., Stephen M. Weld, Boston; Treas., John C. Cobb, Boston. Rept. by Supt., A. F. Cummings, Oct. 1.

133. **WAKEFIELD** and **STONEHAM,** Middlesex Co. (Wakefield, 6,982; Stoneham, 6,155.) Built in '83 by Wakefield Water Co. to supply Wakefield and Stoneham, jointly. Legislative authority for purchase of works by towns was secured in '94. Press repts. state that in Dec. '94, Wakefield voted against purchase, and that about the same time Stoneham voted for it; also that project was revived in '97. SUPPLY.—Smith Pond, otherwise known as Crystal Lake, pumping to stand-pipe. Area of lake 55 acres, with about 30 acres (in '90) flooded to slight depth at high water; max. depth, 26 ft.; general depth, 13 ft.; drainage area, about 1 sq. mile. PUMPS.—Cap., 3,000,000 galls.; two 1,500,000 Knowles dup. STAND-PIPE.—Cap., 565,000 galls.; 40 × 62 ft.; 200 ft. above pumps, 185 ft. above Wakefield, and 125 ft. above Stoneham. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 60 miles. Taps, 2,650. Services, cem.-lined iron. Meters, 28. Hydrants, 181. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $503,008; Cap. Stock, authorized, $75,000, all paid-up. Debt, $598,897: Floating, $39,516; Bonded, $427,000; notes, $57,380. MANAGEMENT.—Prest., S. K. Hamilton. Rept. by Supt., E. J. Chadbourne, Nov. 6. REFERENCE.—Eng. News, June 21, '84.

134. **WALPOLE,** Norfolk Co. (2,604.) Built in '95-6 by town; put in operation Jan. 13, '96. Engr., Freeman C. Coffin; Contr., Moore & Co. SUPPLY.—Driven wells in valley of Low Brook, pumping to stand-pipes. PUMPS.—Cap., 2,500,000 galls.; Blake,

1,500,000 comp. cond.; fire underwriters', 1,000,000. George's Creek coal used; av. cost, $3.85 per short ton. STAND-PIPES.—Cap., 265,000 galls.; two. FISCAL YEAR CLOSED Jan. 1, '95. DISTRIBUTION.—Mains, 15½ miles. Taps, 300; made by town. Services, lead lined; paid for by town to street line. Meters, 76; owned by individuals. Use of meters optional with consumer. Hydrants, public, 111; private, 5. CONSUMPTION.—(Galls.) av., 75,000; max., 115,000; min., 40,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $85,000. Floating debt, $80,000, at 4%. MANAGEMENT.—Prest., H. P. Plimpton; Secy., Arthur N. Cram. Rept. by Secy., Aug. 25. SEWERS.—None.

135. **WALTHAM,** Middlesex Co. (18,707.) Built in '73 by town. SUPPLY.—Open filter basin, near north bank of Charles River, pumping to reservoir. Basin has area of about ¼ acre, and originally its bottom, in center, was 8½ ft. below river level. In '91 a well 40 ft. in diam. was sunk in basin, 18 ft. below its bottom; in '93 well and basin were covered; see Eng. News, Dec. 21, '93. PUMPS.—Cap., 2,750,000 galls.; two Worthington comp. cond., 1,250,000 and 1,500,000. Force mains: Old, 12-in.; new, laid in '92, 24-in. Souman coal used; av. cost, $4 per short ton. RESERVOIRS.—Cap., 6,000,000 galls.; 165 ft. above pumps and 138 feet above highest street level. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 48 miles; cost extensions met by bonds. Taps, 3,100; made by city. Services, iron lined; paid for by city to street line, thence by consumers. Meters, 80; owned by city and consumer; controlled by city; repairs paid by consumer; yearly rental, about 10% of cost. Use of meters optional with city; compulsory for shops, factories, R. Rs., etc. Hydrants, public, 250; private, 35. CONSUMPTION.—(Galls.) av., 1,221,842. PRESSURE.—Ordinary, 56 lbs. One steam fire engine is used. FINANCIAL.—Cost, $549,000. Bonded debt, $408,000, at 4%, due '98 to 1916. Sinking Fund: $27,565, invested in city bonds, at 4%. Expenses: Operating, $29,120; int., $16,187. Revenue: Consumers, $49,870; metered, $5,667; City, $0. MANAGEMENT.—Ch. Pump. Engr., C. H. Whitehouse. Rept. by Supt., Laroy Brown, June 5. PROJECTED IMPROVEMENTS.—New pump and reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Dec. 17, '81; covered infiltration basin, Dec. 21, '93.

136. **WARE,** Hampshire Co. (7,829.) Built in '86-7 by town. SUPPLY.—Wells, pumping to reservoir. Large well, 26 × 22 ft., covered. In '93 this well was supplemented by 12 tubular wells in valley of Muddy Brook, 500 ft. north of large well, and spring, near tubular wells, inclosed by well, 9 × 6 ft., water from new sources flowing to old well. Tubular wells are 28 to 39 ft. deep, av. 34 ft., within an area about 100 × 150 ft. PUMPS.—Cap., 1,500,000 galls.; two Deane comp. dup. cond. Pocahontas coal used; av. cost, $4.65 per short ton. RSERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 682; made by town. Services, w. i., cem. lined; paid for by town to street line. Meters, 500; owned, controlled and repaired by town; yearly rental, $2 to $5. Town can compel use of meters and any consumer may have one. Meters are gradually being introduced on all services. Hydrants, 96. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $115,282. Debt, $54,900: $40,000 at 3½%, $14,900 at 4%. Expenses, $5,849: Operating, $3,799; int., $2,050. Revenue, $9,818: Consumers, unmetered, $1,711; metered, $6,508, including $517 meter rentals; City, fire protection, $1,000; sewer flushing, $57; public buildings, $154; other purposes, $898. MANAGEMENT.—Rept. by Supt., T. C. Gleason, Feb. 8. SEWERS.—Has sanitary and storm sewers.

102. **WAREHAM,** Plymouth Co. See Onset.

D 12, D 13, D 14, F 2. **WARREN,** Worcester Co. (4,681.) Domestic supply furnished by three private systems: Warren Aqueduct Co., built in '37; Aqueduct Co., in '72; J. W. Hastings, in '73. Each plant supplies about 20 families; last two from springs. E. J. Bush is Secy. Warren Aqueduct Co. No sewers. Town has small fire protection plant.

137. **WATERTOWN,** Middlesex Co. (7,076.) Built in '84 by Watertown Water Supply Co.; have sold water to Belmont since '87. FRANCHISE.—Provides for purchase of works by town at any time between 5 and 15 years after construction of plant. Rates are not fixed in franchise nor subject to regulation by city. No legal difficulties. SUPPLY.—Filter galleries and wells, near Charles River, pumping direct and to stand-pipe. Three galleries on same level, 8 to 15 ft. wide, aggregating 467 ft. in length and about 3,190 sq. ft. in area; open well, 20 × 24 ft., covered. Driven wells, 20, each 2½ in. in diam., av. depth, 25 ft. PUMPS.—Cap., 2,500,000 galls.; two Deane comp. cond., 1,000,000 and 1,500,000. STAND-PIPE.—Cap., 377,000 galls.; 40 × 40 ft.; covered, but light and air are admitted. FISCAL YEAR CLOSED Jan. 15. DISTRIBUTION.—Mains, 28 miles; cost extensions met by earnings. Taps, 1,250; made by Co. Services, cem.-lined w. i.; paid for by Co. and consumer jointly. Meters, 1,000; owned by Co.; yearly rental, $2 to $5. Co. can compel use of meters and any consumer may have one. Hydrants, public, 226; private, 16. CONSUMPTION.—(Galls.) av., 420,000; max., 1,200,000. PRESSURE.—Ordinary, 65-90 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $312,500. Cap. Stock, authorized, $150,000, all paid-up; paid 6% div'd in '91. Bonded debt, $150,000, at 5%, due 1900. Expenses (in '90): Taxes, $1,400. MANAGEMENT.—Prest., A. O. Davidson; Secy. and Supt., John H. Perkins; Treas., John H. Conant. PROJECTED IMPROVEMENTS.—See Metropolitan Water Supply, under Boston. SEWERS.—Has sanitary sewers.

29. **WAYLAND,** Middlesex Co. (2,060.) See Cochituate, which is principal village in this town.

138. **WEBSTER,** Worcester Co. (7,031.) Now owned by town. Domestic supply introduced in '82 from works built in '68 by H. N. Slater Co. for fire protection; bought by town in '93 and put in operation Jan. 1, '94. Engr., F. L. Fuller, Boston; Contr., L. A. Taylor, Boston. SUPPLY.—Covered collecting well, 25 × 30 ft., about 300 ft. from Lake Chaubunagungamaug, pumping direct and to stand-pipe. Lake has area of 1,250 acres; drainage area, excluding water surface, est., 778 miles. PUMPS.—Cap., 1,000,000 galls.; Blake comp. cond. Bituminous coal used; av. cost, $4.27 per short ton. RESERVOIR.—Cap., 1,000,000 galls. STAND-PIPE.—Cap., 528,800 galls.; 30 × 100 ft., covered with conical wooden roof; 13-16 to ¼-in. iron plates, ¾-in. bottom. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 9 miles; cost extensions met by appropriation. Taps, 530; made by town. Services, gal. i.; paid for by town to curb. Meters, 143; owned by consumer; controlled and repaired by town. Town can compel use of meters and any consumer may have one. Hydrants, 103. CONSUMPTION.—(Galls.) av., 255,000. PRESSURE.—Ordinary, 100 lbs. One steam fire engine used. FINANCIAL.—Cost, $111,949. Bonded debt, $111,949, at 4%. Sinking Fund, $4,081, in savings bank. Expenses: Operating, $2,076; int., $3,799. Revenue: Consumers, unmetered, $6,224, for 9 mos.; metered, $4,226. MANAGEMENT.—Prest., John Flint; Secy., L. J. Opham; Treas., O. Shomnay; Supt., Michael Schofield; Ch. Pump. Engr., R. Gatski. Rept. by Supt., June 1. SEWERS.—Has storm and partial system of sanitary sewers.

139. **WELLESLEY,** Norfolk Co. (3,600.) Built in '84 by town. SUPPLY.—Filter gallery and well, pumping to open distributing reservoir and direct. Gallery, 11 × 63 ft., 17 ft. 10 in. to top of inside of arch; on bank of Rosemary Brook, 400 ft. from Charles River; there is a direct connection with brook for emergency use. Well, 22 × 20 ft., built in '86 at Williams' Spring, 1,000 ft. from gallery. PUMPS.—Cap., 1,000,000 galls.; Blake comp. cond. dup. RESERVOIR.—Cap., 1,151,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 26 miles; cost extensions met by issue of bonds. Taps, 685; made by town, free. Services, w. i., cem. lined; paid for by town to street line, thence by owner. Meters, 656; owned, controlled and repaired by town. Use of meters compulsory for all consumers. Hydrants, public, 210; private, 10. CONSUMPTION.—(Galls.) av., 175,000; max., 240,000; min., 150,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $242,862. Bonded debt, $220,000, at 4%, due '96 to 1915. Sinking Fund, $50,120, invested in town securities, at 4%. Expenses: Operating, $5,747; int., $8,542. Revenue: Consumers, metered, $9,427; City, fire protection, $4,200; street sprinkling, $200; public buildings, $94; water troughs, $400. Deficits are all met by taxation. MANAGEMENT.—Chn. Water Bd., F. L. Fuller, 12 Pearl St., Boston; Secy., A. P. Dana, 53 State St., Boston; Comr., W. S. Ware; Supt., W. H. Vaughn, Wellesley Hills; Regr., Albert Jennings; Ch. Pump. Engr., R. A. McWilliams. Rept. by Chn., Oct. 12. PROJECTED IMPROVEMENTS.—Increased supply. SEWERS.—None. REFERENCE.—Eng. News, Oct. 10, '85.

140. **WESTBOROUGH,** Worcester Co. (5,195.) Built in '78 by town. SUPPLY.—Sandra Pond, by gravity. Ponds two miles from and 134 ft. above center of town; area, 51 acres; drainage area, about 700 acres; cap., 123,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 15½ miles; cost extensions met by sale of bonds. Taps, about 700. Services, iron; paid for by town to property line, thence by consumer. Meters, 150; owned, controlled and repaired by town; yearly rental, 10% of cost. Use of meters optional with consumers, except compulsory for manufacturers. Hydrants, public, 89; private, 3. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $195,000. Bonded debt, $116,000: $55,000, at 5%, due 1908; $35,000, at 4%, due 1908; $20,000, at 4%, due 1916; $6,000, at 4%, due 1919. Sinking Fund, $37,000, invested in real estate, chiefly, at 5 to 6%. Revenue: Consumers, $8,500; City, fire protection, $900; street sprinkling, $25. MANAGEMENT.—Prest., J. L. Brigham; Secy., H. W. Kimball. Rept. by Supt., J. B. Putnam, July 15. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 1, '82.

D 15, D 16, D 17, F 3. WEST BROOKFIELD, Worcester Co. (1,592.)

AQUEDUCT COS.

West Brookfield Aqueduct Co., built in '38; Quaboag Aqueduct Co., in '51; Cement Aqueduct Co., in '68-9. Each has a supply from wells or collecting galleries, by gravity.

TOWN PLANT.

Built in '84 for fire protection. In '89 supply was from brook, by gravity, with about 1½ miles of mains, 3 hydrants and 8 fire cisterns.

141. **WESTFIELD,** Hampden Co. (9,805.) Built in '74 by town. SUPPLY.—Moose Meadow and Sand Spring Brooks in Montgomery, by gravity from impounding and distributing reservoirs on Moose Meadow Brook. Reservoirs about 2½ miles apart, and water flows in open channel between two, falling 479 ft. Drainage area, 4¼ sq. miles, of which 2¼ sq. miles is between the two reservoirs. RESERVOIRS.—Cap., 188,000,000 galls. Mountain Lake, 184,000,000; area, 38 acres. Distributing, 4,000,000; 2½ miles from, 479 ft. below storage reservoir. Supply main (in '89), 14 in., c. i., 4½ miles long.

FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains (in '90), 14 miles; cost extensions met by rentals. Taps made free. Services, iron; paid for by consumer. Meters: 25; owned by town and consumer jointly; controlled by town; repairs paid by owner. Use of meters compulsory for livery stables. Consumers may not have meters. Hydrants, public, 164; private, 18. CONSUMPTION.—(Per capita, galls.), av., 100; max., 200; min., 50. PRESSURE.—Ordinary, 65-115 lbs. FINANCIAL.—Cost, $290,930. Bonded debt, $148,000: $7,500, at 3½%, due $2,500 yearly; $78,000, at 4%, due $5,500 yearly; $40,000, at 4%, due $5,000 yearly; $22,500, at 4%, due $2,500 yearly, beginning in '99. Expenses, int., $8,390. Revenue: Consumers, $24,363; City, none. Deficits are wholly met by taxation. MANAGEMENT.—Chn., Robt. H. Kneil; Secy., Chas. N. Oakes; Treas., Chas. A. Froth; Supt., H. T. Snow. Rept. by Secy., Sept. 28. PROJECTED IMPROVEMENTS.—Additional supply from Munn's Brook, Granville; right to use has been obtained. SEWERS.—Has sewers. REFERENCE.—Eng. News, Apr. 1, '82.

D 18. **WESTHAMPTON,** Hampshire Co. (477.) Domestic works built in '94 by Westhampton Water Co. Press rept., Nov., '95, stated there were 18 water takers, with annual income of $99. Prest., H. M. Clapp; Clerk, A. K. Chapman.

142. **WESTON,** Middlesex Co. (1,664.) Built in '95 by Weston Water Co. Engr., E. H. Burlingame, Providence, R. I.; Contr., C. H. Eglee, Flushing, N. Y. FRANCHISE.—Co. is not exempt from local taxes. City to pay for use of hydrants. No legal difficulties. SUPPLY.—Large well, by pumping to reservoir. PUMP.—Small Davidson. Cumberland coal used; av. cost, $4 per short ton. DISTRIBUTION.—Mains, 6 miles; cost extensions met by private subscriptions. Services, galv. i.; paid for by consumer. Meters, 50; owned, controlled and repaired by Co. Use of meters compulsory for all consumers. Hydrants, public, 19; private, 5. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $35,000. MANAGEMENT.—Prest. and Supt., A. H. Hews; Secy. and Treas., Horace S. Sears; Ch. Pump. Engr., Percy Warren. Rept. by Prest., Aug. 18. SEWERS.—None.

D 19. **WESTPORT HARBOR** (P. O., Adamsville, R. I.), Bristol Co. (Town of Westport, 2,599.) Built in '91 by Westport Harbor Aqueduct Co. for domestic supply. Supply, well, by gravity to 15,000-gall. reservoir. Cap. Stock, $3,000. Prest., E. S. Brown; Treas., A. Manchester. No rept. since '90-1 Manual.

143. **WEST SPRINGFIELD,** Hampden Co. (5,077.) Now owned by town. Built in '75 by West Springfield Aqueduct Co. Town took possession in July, '92, and in Dec., '96, appraisers fixed price to be paid by town at $125,413 and interest from July, '92. Town appealed, but Supreme Court confirmed award in Oct., '96. Supplies village of Mittineague, within town limits. SUPPLY.—Darby Brook, by gravity from impounding reservoir, of 3 acres area; also springs and well, pumping to tank for high service. Spring water brought by small pipes to settling well, thence to 25 × 14-ft. well, near reservoir, from which it is pumped for high service. In '95 additional springs in the valley of Block Brook were diverted to Darby Brook. PUMP.—Cap., 575,000 galls.; Deane, drven by windmill. DISTRIBUTION.—Mains, 9 miles. Taps (early in '94), 553. Meters, 0. Hydrants, 20. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $75,509. Cap. Stock, authorized, $50,000, all paid-up. NOTE.—All information except that relating to purchase and improvement of works and number of taps is from '89-90 Manual. REFERENCE.—Eng. News, Oct. 28, '82.

D 20. **WEST STOCKBRIDGE,** Berkshire Co. (1,492.) Built in '73 by East Mcuntain Water Co. for domestic supply. Franchise does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Supply, mountain springs, by gravity; 30,000-gallon reservoir. Mains, 2 miles; cost extensions met by assessment of stockholders. Taps, 40; made by Co., free. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with Co. Consumption, (Galls.) av., 1,500 (est.) Pressure, ordinary, 90-100 lbs. Cap. Stock: authorized, $4,000; all paid-up. Div'd in '96 applied to debt. Floating debt, $600, at 6%. Expenses: Operating, $60 (est.). Revenue, other purposes, $432. Prest., W. M. Kniffin; Secy., C. W. Kniffin; Treas. and Supt., J. S. Moore. Rept. by Supt., June 5. No sewers. Reference, Eng. News, Oct. 28, '82.

144. **WEYMOUTH,** Norfolk Co. (10,866.) Built in '85 by town. Weymouth includes Weymouth Landing, North, East and South Weymouth. SUPPLY.—Weymouth Great Pond, by gravity, and for South Weymouth, pumping to stand-pipe. Area of pond, 290 acres; drainage area, exclusive of pond, 631 acres; 154 ft. above sea level. Supply main (in '89), 18-in. to pumping station, then 14, 12 and 10, successively. PUMPS.—Cap., 3,000,000 galls.; Blake, comp. dup., 1,500,000; Deane dup. comp. cond., 1,500,000. Webster bituminous coal used; av. cost, $3.80 per short ton. STAND-PIPE.—Cap., 700,000 galls.; iron, 40 × 75 ft., on masonry foundation. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 55 miles; cost extensions met by bonds. Taps, 2,320; made by town. Services, lead; paid for by town to street line. Meters: 8; owned, controlled and repairs paid by town; yearly rental, none. Use of meters not optional with consumer, and compulsory for manufacturers. Hydrants, public, 356; private, 28. CONSUMPTION.—(Galls.) av., 1,500,000; max., 3,000,000; min., 1,000,000. PRESSURE.—Ordinary, 15 to 60 lbs.; fire, 65 to 110 lbs. Steam fire engines are used. FINANCIAL.—Cost, $455,495. Bonded debt, $440,000, at 4%. Sinking Fund: $79,286, invested at 4 and 5%. Expenses: Operating, $6,650. Revenue: City, fire protection, $6,760; street

sprinkling, $110; public buildings, $300. MANAGEMENT.—Chn., Aug. J. Richards; Secy., Henry A. Nash; Treas., John H. Stetson; Supt., Geo. J. Ries; Ch. Pump. Engr., Geo. M. Sargent. Rept. by Supt., Dec. 28. SEWERS—None.

D 21. **WHATELY,** Franklin Co. (779.) Built by Irving Allis. Supply, springs, impounded in a 16,000-gall. reservoir, thence by gravity. Pressure, 90 lbs. Supply developed mostly for domestic purposes.

145. **WHITINSVILLE,** Worcester Co. (Est., 2,500.) Built in '89 by Whitin Machine Co. SUPPLY.—Springs, by gravity from reservoir; springs gathered in vitrified drain pipes, covered with broken stone. RESERVOIR.—Cap., 300,000 galls.; covered; 110 ft. above village. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 7 miles. Taps, 400. Meters, 0. Hydrants, 45. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Whitin Machine Works. NOTE.—No rept. since '90-1 Manual.

146. **WHITMAN,** Plymouth Co. (4,441.) Built in '83-4 by town. SUPPLY.—Well, pumping to stand-pipe. Filter galleries have been used some of the time; 100 ft. long, 15 ft. wide by 14 ft. deep, and 416 ft. long, 1½ ft. wide by 1 2-3 ft. deep. Galleries on shore of Hobart's Pond, a mill pond on Shumatuscacant River; area of pond, 175 acres, drainage area, est., 6.4 sq. miles. PUMPS.—Worthington comp. non-cond., 1,250,000; also Blake (1,500,000?). Bituminous coal used; av. cost, $3.78 per short ton. STAND-PIPE.—Cap., 246,000 galls.; 20 × 105 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 15½ miles; cost extensions met by bonds. Taps, 860. Services, cement lined; paid for by consumer from street line. Meters: 400; owned, controlled and repaired by town; yearly rental, 10% of cost. Use of meters compulsory for manufacturers and certain consumers. Town can compel use of meters and any consumer may have one. Hydrants, public, 118; private, 19. CONSUMPTION.—(Galls.) av., 275,000; max., 450,000; min., 200,000. PRESSURE.—Ordinary, 65 lbs.; fire, 65-75 lbs. FINANCIAL.—Cost, $116,942. Bonded debt, $97,000, at 4%; due in 20 years. Sinking Fund: $20,000, invested in town bonds. Expenses: Operating, $3,500; int., $3,800. Revenue: Consumers, unmetered, $2,401; metered, $3,911; City, fire protection, $2,800. MANAGEMENT.—Prest., Geo. E. Hersey; Secy., Treas. and Supt., J. C. Gilbert. Ch. Pump. Engr., L. C. Hall. Rept. by Supt., June 10. SEWERS.—None.

P 12. **WILLIAMSBURG,** Hampshire Co. (2,057.) Municipal works projected. Legislative authority not yet obtained. Proposed supply, East Branch of Mill River, by gravity. Address E. C. Davis, Engr., Northampton, Mass.

147. **WILLIAMSTOWN,** Berkshire Co. (4,221.) First supplied in '59 by Williamstown Aqueduct Co. In '88 Williamstown Water Co. built works and bought old plant. SUPPLY.—Spring and Paul Brook by gravity from reservoirs. RESERVOIR.—One 50 × 30 × 5 ft. deep; covered; near spring; another, built in '92, on Paul Brook, from which a 6-in. pipe, ¾ miles long, leads to old reservoir. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 15 miles. Taps, 300. Hydrants, 70. FINANCIAL.—Cost, withheld. MANAGEMENT.—Prest., A. C. Houghton; Secy., W. B. Clark; Supt., C. G. Sanford. PROJECTED IMPROVEMENTS.—Contract let for new reservoir (press rept.). SEWERS.—Has sewers. REFERENCE.—Eng. News, Oct. 10, '85.

27. **WILLIMANSETT,** Hampden Co. See Chicopee.

148. **WINCHENDON,** Worcester Co. (4,390.) Put in operation Jan. 1, '97, by town. Engr., F. L. Fuller, 12 Pearl St., Boston. SUPPLY.—Well, by pumping. PUMP.—Cap., 1,000,000 galls.; Blake. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 13.2 miles. Taps, 90; made by Supt., free. Services, tarred i.; paid for by town to street line. Meters: 90; owned, controlled and repaired by town; compulsory for all consumers. Hydrants, public, 90; private, 15. CONSUMPTION.—45,000 galls. (av.) PRESSURE.—Ordinary and fire, 40 to 150 lbs. FINANCIAL.—Cost, $100,000. Bonded debt, $99,000 at 4%. MANAGEMENT.—Chn., J. H. Fairbank; Supt. and Pump. Engr., E. L. Stone. Rept. by Mr. Fuller, Jan. 19, '97. SEWERS.—None.

149. **WINCHESTER,** Middlesex Co. (4,861.) Built in '73 by town. SUPPLY.—Surface water, by gravity from impounding reservoir; also by pumping to high service reservoir. About 120 families supplied by high service. Drainage area, excluding water surface, 392 acres. PUMPS.—Worthington dup., 250,000 steam; also pump driven by 30-ft. windmill, which "does lots of work in windy weather." Wood used as fuel. RESERVOIRS.—Impounding; Cap., 260,000,000; area, 63 acres; drainage area, exclusive of reservoir, 385 acres; max. depth, 25 ft., av. depth, 18 ft.; 121 ft. above town. South reservoir: Area, 160 acres. High service: Cap., 100,000; 40½ ft. diam.; 10½ ft. deep; stone and cement, lined with brick; built in solid rock on hill-top. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 23 miles; cost extensions met by appropriations or loans. Taps, 1,500; made by town. Services, cement lined w. i.; paid for by town to street line. Meters: 6; owned, controlled and repaired by town. Use of meters optional with town; compulsory for large blocks, hotels or motors. Hydrants, public, 120; private, 8. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 45 lbs. Steam fire engines are used. FINANCIAL.—Cost, $442,621. Bonded debt (whole town) $345,000, at 4%, due from '97 to 1926; $12,000, at 3¾%, due 1901. No sinking fund; some of bonded debt paid yearly. Expenses: Operating, $4,345; int., $14,700. Revenue: Consumers, unmetered, $22,019; City, none. Works now pay operating expenses and interest. Deficit in past years met by taxation. MANAGEMENT.—Chn., David N.

Skillings; Town Treas., Thos. S. Spier. Rept. by Supt., W. T. Dotten, Aug. 20. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, July 15, '82; comparison of pipes, Oct. 24, '95.

112, P 13. **WINTHROP,** Suffolk Co. (2,726.) Supply from Revere. Press repts. state that town has been investigating matter of independent supply for past 2 or 3 yrs., ground water being considered. NOTE.—See Metropolitan Water Supply, under Boston.

150. **WOBURN,** Middlesex Co. (13,499.) Built in '73 by city. SUPPLY.—Ground water from filter gallery near Horn Pond, pumping direct and to reservoir. Area pond, 103 acres; depth, 20 ft.; drainage area, 7¼ sq. miles. PUMPS.—Cap., 4,000,000 galls; Worthington 2,000,000 comp. cond.; Blake 2,000,000. FILTER GALLERY.—(In '89.) Is 12 × 82 ft., × 5 ft. deep (av.) with side walls of dry rough stone, covered by semi-circular brick arch. RESERVOIR.—Cap., 6,000,000 galls. Distributing; 160 ft. above town; 220 ft. above pumps, on Horn Pond Mt. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 51 1-3 miles; cost extensions met by appropriations. Taps, 2,501; made by city, free. Services, w. i. cement-lined; paid for by consumer. Meters: 68; owned and controlled by city. Use of meters optional with city; compulsory for manufacturing. Hydrants, public, 325; private, 4. CONSUMPTION.—(Galls.) av., 965,143. PRESSURE.—Ordinary, 65 to 90 lbs. Steam fire engines are occasionally used. FINANCIAL.—Cost, $588,313. Bonded, $226,900, at 4%. Sinking Fund, $491. Expenses: Operating, $20,671; int., $10,070. Revenue, $45,749: Consumers, unmetered, $32,423; metered, $6,806; City, fire protection, $6,520. Surplus of $15,000. MANAGEMENT.—Chn., Edw. E. Parker; Clerk and Registrar, N. P. Barrett; Supt. P. F. Prilly; Ch. Pump Engr., Edw. P. Pollard. Rept. by Albert P. Barrett, Jan. 9, '97. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, May 13, '82.

54. **WOODVILLE,** Middlesex Co. Supply from Hopkinton.

151. **WORCESTER,** Worcester Co. (84,655.) First supplied in 1798 by Dan'l Gooding. In '45 Worcester Aqueduct Co. was incorp.; its works were bought by city in '52. Present works built in '64 by city; enlarged in '92. When city built works three small private systems were in operation. SUPPLY.—Impounding reservoirs, one in Holden and one in Leicester. Each about 5 miles from city, by gravity; also connection with Kettle Brook. RESERVOIRS.—Cap. (not including Kettle Brook supply), 1,463,500,000 galls. Holden impounding: 780,000,000; on Tatnuck Brook. Dam raised 10 ft. in '92 or '93, increasing cap. by 230,000,000 galls., or more. Max. depth, 30.1 ft.; av., 15.2 ft. Area, 149½ acres; drainage area, 2,915 acres. Leicester Impounding: 678,000,000; on Lynde Brook; dam carried away in Mar., '76; see Eng. News, as below. Max. depth, 37.4 ft.; av., 14.6. Area, 143 acres; drainage area, 1,870 acres. Hunt Distributing: 3,000,000; filled by gravity from Leicester reservoir. Bell Pond Distributing: Supplied from Leicester reservoir. In latter part of '94 temporary connection was made with Kettle Brook, and early in '95 a 30-in. c. i. pipe was laid between Kent reservoir, on brook, to Leicester reservoir. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 142 miles; cost extensions met by loans outside of debt limit. Taps, 12,000; made by city. Services, cement lined; paid for by city to street line, thence by consumer. Meters: 10,807; owned by city or consumer; controlled and repaired by city; yearly rental, none. City can compel use of meters in certain cases and any consumer may have one. Hydrants, public, 1,418; private, 140. CONSUMPTION.—(Galls.) av., 6,500,000. PRESSURE.—Ordinary, 70 lbs., low service; 125 lbs., high service. Steam fire engines are used. FINANCIAL.—Cost, $2,697,134. Expenses: Operating, $55,000; int., $64,583. Revenue, $200,256; Consumers, unmetered, $13,906; metered, $185,623. MANAGEMENT.—Clk. and Water Reg., Geo. E. Batchelder; Supt., J. G. Brady. Rept. by Clk., July 15. PROJECTED IMPROVEMENTS.—New dam, at Leicester, under construction. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, July 9, '81. Lynde Brook dam failure, April 1, 8, 15, '76; Jan. 3, '78; July 9, '81; Jan. 25, '94.

RHODE ISLAND.

1. **APPONAUG,** Kent Co. (Not given.) Supply from East Greenwich.

11. **ARKWRIGHT** (P. O., Fiskeville), Kent Co. Supply from Phenix.

14. **ARCTIC,** Kent Co. Supply from Warwick.

10. **ASHTON,** Providence Co. Supply from Pawtucket.

D 1. **BARRINGTON,** Bristol Co. (1,461.) Built in '87 by Barrington Water Co. Supplies Nayatt Point. Supply from Bristol & Warren Water Works Co.'s system, under contract. Co. is exempt from local taxation. No legal difficulties. Services, iron and lead, paid for by consumer. Meters, about 40; property of consumer and controlled by Co. Hydrants, 0. Pressure, 46 to 50 lbs. No debt. Prest., Lucien Sharpe; Secy., Chas. P. Brown; Treas., J. W. Starkweather. No sewers.

10. **BERKELEY** (P. O., Ashton), Providence Co. Supply from Pawtucket.

2. **BLOCK ISLAND,** Newport Co. (Est., 1,300.) Built in '88 by Block Island Water Co. SUPPLY.—Pond, pumping to stand-pipe. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains (in '90), 1½ miles. Taps, 35. Meters, 0. Hydrants, public, 10. FINANCIAL.—(In 90.) Cost, $12,000. No debt. Expenses, $200. Revenue, $850.

3. **BRISTOL AND WARREN,** Bristol Co. (Bristol, 5,478; Warren, 4,489.) Built in '82 by Bristol & Warren Water Co. Water is sold to Barrington Water Co., which supplies Barrington and Nayatt Point. Bristol voted in May, '95, to buy plant, and voted $200,000 to pay for and extend same. Co. refused to appoint arbitrator, and matter went into courts. Nov., '96, Appellate Court of Rhode Island decided in favor of town, and press rept. stated that preliminaries for purchase would proceed. FRANCHISE.—50 yrs. from '82. Provides for purchase of works by city after 10 and within 15 yrs. from '82, price to be fixed by arbitrators. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Kickenmit River, pumping to tank; filtered through sand and gravel. PUMP.—Cap., 1,000,000 galls. STAND-PIPE.—Cap., 329,000 galls.; 40 × 35 ft. DISTRIBUTION.—Mains, 10 miles. Taps, 625. Meters, 15. Hydrants, 130. CONSUMPTION.—(Galls) av., 300,000. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $250,000. Cap. Stock: Authorized, $250,000; all paid-up; paid 6% div'd in '93. MANAGEMENT.—Treas., G. Norman Weaver, Newport, R. I. NOTE.—No repts. since '90-1 Manual.

4. **CENTRAL FALLS,** Providence Co. (Est. 13,765.) Distribution built in '79 by fire district, which has since become part of city of Central Falls. Press rept., Apr., '96, states city had just bought from Pawtucket about 7,000 ft. of pipe which Pawtucket laid in Valley Falls some time ago, Valley Falls now being part of Central Falls. Water is supplied to Central Falls by Pawtucket, and some of figures belonging under distribution are apparently included under Pawtucket. NOTE.—No rept. since '90-1 Manual.

11. **CLYDE** (P. O., Riverport), Kent Co. Supply from Phenix.

14. **COVENTRY,** K nt Co. See Warwick.

5. **COWESETT,** Kent Co. Supply from East Greenwich.

11, 12. **CRANSTON,** Providence Co. (8,099.) Supply from both city of Providence and Pawtucket Valley Water Co., Phen.x.

D 2. **DROWNVILLE,** Bristol Co. (Est., 500.) Built in '87 by Drownville Water Co. urder perpetual franchise. Franchise, perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes, but receives no compensation for public service. Supply, wells, pumping to tank. Small pump (in '90), driven by windmill, with small Davidson steam pump as auxiliary. Pocahontas coal used; av. cost, $4 per short ton. Tank, cap., 52,000 galls.; 16 × 24 ft. Mains, 2 miles. Taps, 63; made by Co. Services, iron or lead; paid for by consumer. Meters, about 45, owned by consumer; controlled by Co. Use of meters optional with consumer. Consumption, (Galls.) av., about 15,000. Pressure, ordinary, 40 lbs. Cost, $10,000. Cap. Stock: Authorized, $50,000; paid-up, $7,500. Floating debt, $2,000, at 6%. Expenses, Operating, $350. Revenue, $700. Prest., John Jencks; Secy. and Supt., Chas. F. Anthony; Treas., Geo. T. Baker. Rept. by Supt., June 18. No sewers.

5. **EAST GREENWICH,** Kent Co. (3,127.) Built in '86 by East Greenwich Water Supply Co. In '90 extension was made to supply Cowesett and in '91 to supply Apponaug. FRANCHISE.—Does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Hunt's River, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington; one. comp. cond., one simple high pressure. STAND-PIPE.—Cap., 160,000 galls. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 11 miles. Taps, 351. Services, w. i. Meters, 60. Hydrants, public, 54. CONSUMPTION.—(Galls.) av., 200,000. FINANCIAL.—Cost, $115,000. Bonded debt, $88,000: $73,000, at 5%, due in 1906; $15,000, at 6%, due in 1910. Expenses: Operating $3,000; int., $4,550. Revenue: Consumers, $6,500; City, $1,525. MANAGEMENT.—(In '94), Supt. and Treas., Oliver W. Slocum. NOTE.—No report since '90-1 Manual, for main works.

APPANAUG EXTENSION.

Dec. 1, '91, Mr. John L. Congdon (then Secy.), gave the following information regarding extension: Water turned on Nov. 1, '91. Mains, 4 miles. Taps, 70. Meters, 5. Hydrants, 16. Cost, $10,000. Revenue: Consumers, $1,400; City, 16 hydrants and 1 drinking fountain, $400.

6, 7. **EAST PROVIDENCE,** Providence Co. (8,422.)

EAST PROVIDENCE FIRE DISTRICT.

Now owned by East Providence Water Co. Works originally built by district and put in operation about Aug. 1, '93; bought by East Providence Water Co. latter part of '95 for $2,100 cash, Co. assuming bonded debt of district; total consideration reported as about $200,000. SUPPLY.—Ten Mile River, pumping direct (stand-pipe having failed Jan. 1, '94). MANAGEMENT.—(Late in '95) Prest., Benj. A. Jackson. NOTE.—No official rept. Above prepared from press repts. Engr. for works was S. M. Gray, Providence. REFERENCES.—Stand-pipe failure, Eng. News, Sept. 14, '93; Jan. 25, Feb. 8, 22, Mar. 1 and 8, Apr. 12, May 10, '94; Apr. 25, '95.

WATCHEMOKET FIRE DISTRICT.

Built in '80 by district. Water supplied and works operated by city of Pawtucket, which pays rebate of 25% (or did) on all collections. See Pawtucket.

11. **FISKEVILLE**, Providence Co. Supply from Phenix.

11. **HOPE**, Providence Co. Supply from Phenix.

8. **JAMESTOWN**, Newport Co. (707.) Built in '90 by Jamestown Light & Water Co. FRANCHISE.—30 yrs. from '90. Hydrant rental, $60 each. SUPPLY.—Wells, pumping to stand-pipe. One of the wells was sunk in '92 and is 30 × 20 ft. (press rept.). STAND-PIPE.—Cap., 360,000 galls. DISTRIBUTION.—Mains (in 90), 2½ miles. Meters, not given. Hydrants, 20. PRESSURE.—Ordinary (in '90), 60 lbs. FINANCIAL.—Cost withheld. City, fire protection, $30. MANAGEMENT.—Supt., Norman Weaver, Newport. SEWERS.—None.

12. **JOHNSTON** (P. O., Olneyville), Providence Co. (9,778.) Supply from Providence.

13. **KINGSTON**, Washington Co. Supply from Wakefield.

11. **LIPPITT** (P. O., Phenix), Kent Co. Supply from Phenix.

10. **LONSDALE**, Providence Co. Supply from Pawtucket.

16. **MANVILLE**, Providence Co. Supply from Woonsocket.

P 1. **MARIEVILLE**, Providence Co. (?) (Not given.) Legislative authority has been secured and town has organized a fire district. Est. cost of distribution system, $15,000. District appointed Com. to contract with Pawtucket for purchase of water and Pawtucket city council passed resolution authorizing contract, which was vetoed by Mayor late in Nov., '96.

13. **NARRAGANSETT PIER**, Washington Co. Supply from Wakefield.

D 1. **NAYATT POINT**, Bristol Co. Supply from Barrington.

9. **NEWPORT**, Newport Co. (19,457.) Built in '76-7 by Geo. H. Norman; now owned by Newport Water-Works Co. FRANCHISE.—50 yrs. from '76. Rates are fixed by an agreement with city. Co. is exempt from local taxes. City to pay $10,300 per annum for supply designated in the contracts with city for that purpose. No legal difficulties. SUPPLY.—Storage reservoirs, by gravity from one and by pumping to distributing reservoir from the other three. PUMPS.—Cap., 13,000,000 galls. Station No. 1; Reynolds-Corliss (Allis) hor. comp. cond. operating 7,000,000 Blake; Knowles, comp. direct-acting pump, 3,000,000. Station No. 2; Curtis, comp. cond. vert., 3,000,000. Anthracite coal used. FILTERS.—Cap., 4,000,000 galls. Hyatt (or New York) mechanical. RESERVOIRS.—Impounding: Two in Newport and Middletown, one in Middletown, and one in Portsmouth. Distributing: One 8,000,000 galls. FISCAL YEAR CLOSED May 31.—DISTRIBUTION.—Mains, 63 miles; cost extensions met by stock. and income. Taps, 4,000; made by works, free. Services, tar-coated iron, cement lined; paid for by Co. to street line. Meters: 55; owned by consumer; repairs made by Co. and charged to consumer. Use of meters compulsory for manufacturing plants and hotels. Co. cannot compel universal use of meters and consumers may not have them. Hydrants, public, 252; private, 4. CONSUMPTION.—(Galls.) av., 2,100,000; max., 3,000,000; min., 1,800,000. PRESSURE.—Ordinary, 20-60 lbs.; steam fire engines are used in higher portions of city. FINANCIAL.—Cost, $1,800,000. Cap. Stock: Authorized, $2,000,000; paid-up. $1,800,000; paid 4% div'd. Expenses: Taxes, in Middletown and Portsmouth, $352. Revenue, Sewer flushing, $10,300. MANAGEMENT.—Prest., Geo. H. Norman.; Secy., G. Norman Weaver.; Treas., Wm. S. Slocum; Gen. Mgr., Geo. H. Norman, Jr.; Ch. Pump. Engr., A. C. Burns. Rept. by Treas., July 23. SEWERS.—Has combined sanitary and storm sewers. REFERENCES.—Eng. News, Jan. 7, '82; Feb. 27, '92.

12. **OLNEYVILLE**, Providence Co. Supply from Providence.

10. **PAWTUCKET**, Providence Co. (Pawtucket only, 27,633; East Providence, 8,422.) Built in '77-9 by city. In '79 Central Falls fire district was first supplied, and in '80 Watchemoket fire district, in town of East Providence, each district building and owning distribution system. In '81 or '82, Pawtucket extended its plant to supply Lonsdale and Valley Falls, and in '84 to supply Berkeley and Ashton. In '96 Central Falls (press rept.) bought pipe laid in Valley Falls, which had been made part of Central Falls since Pawtucket laid pipe. SUPPLY.—Abbott's Run, pumping to reservoir. PUMPS.—Cap., 12,000,000 galls.; Corliss; 2—3,000,000 and 1—6,000,000. Bituminous coal used; av. cost, $3.79 per short ton. FILTERS.—Cap., 10,000,000 galls. Sand, gravel and charcoal; area, 2,060 sq. ft.; upward filtration through 6 ft. of material. RESERVOIRS.—Cap., 1,620,000,000 galls. Impounding at Diamond Hill, 1,600,000,000 galls.. Distributing at Stump Hill, 20,000,000 galls. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 128 miles; cost extensions met by appropriations. Taps, 7,071; made by city, free. Services, lead-lined iron and w. i.; paid for by city to fence line. Meters, 5,089; owned, controlled and repaired by city. Use of meters optional with city; compulsory for all using more than three faucets. Hydrants, public, 916. CONSUMPTION.—(Galls.) av., 5,471,088; max., 8,564,285; min., 2,691,491. PRESSURE.—Ordinary, 70-130 lbs. FINANCIAL.—Cost, $1,735,489. Debt, $1,696,318: Floating, $71,318, at 4, 4½ and 5%; Bonded, $500,000, at 5%; $1,125,000, at 4%. Sinking Fund, $455,045, invested at 4%. Expenses: Operating, $53,576; int., $56,542. Revenue: Consumers, $142,296; City, fire

protection, $17,800; street sprinkling, $1,847; sewer flushing, $980; drinking fountains, $520. MANAGEMENT.—Comr. Pub. Wks., L. G. Ladd. Rept. by Dept. of Pub. Wks., June 8. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 20, '81; dam and filter gallery, June 1, '89.

12. **PAWTUXET,** Providence. (Est., 620.) Supply from Providence.

13. **PEACEDALE,** Washington Co. Supply from Wakefield.

11. **PHENIX,** Kent Co. (Est., 1,000.) Built in '85-7 by Pawtuxet Valley Water Co. Co. also supplies Hope, Fiskeville, Arkwright, Clyde, River Point and Lippitt, all in Pawtuxet Valley; part of Cranston is also supplied, one or more of above villages probably being in that town. FRANCHISE.—Provides for purchase of works by the city in 1911. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Spring Lake Brook, by gravity from reservoirs. RESERVOIRS.—Cap., 35,000,000 galls. Dam gave way Aug. 25, '89, and was subsequently repaired. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 14 miles. Services, lead; paid for by consumer. Meters: 48; owned by consumer. Use of meters compulsory for all large consumers. Co. can compel use of meters. Hydrants, public, 134; private, 10. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock (in '90): Authorized, $100,000; paid-up, $38,000. Floating debt, $16,000; Bonded, $50,000, at 5%. Revenue: City (in '90), $3,540. MANAGEMENT.—Prest., Richard G. Howland, Hope; Secy., Vernum A. Bailey; Treas., Presbury Hoxie; Supt., Albert F. Hill. Rept. by Secy., Nov. 11.

12. **PROVIDENCE,** Providence Co. (132,146; additional outside population supplied, est. in '94, 11,500.) Present works built in '70-6 by city; first supplied in 1772 by Co. Water is supplied to several suburbs, through mains laid by Providence in various years, as follows: Johnston, '73; Olneyville, '75; Cranton, '76; Pawtuxet, '80. SUPPLY.—Pawtuxet River, pumping to reservoirs and repumping from Hope to Fruit Hill reservoir. PUMPS.—Cap., 48,000,000 galls. Worthington triple exp. high duty, 15,000,000, and dup. high pressure, 5,000,000; Cornish (engine), 9,000,000; Corliss (vert. engine), 9,000,000; Nagle high service, 5,000,000; Holly Gaskill comp. hor. high service, 5,000,000. Anthracite and Bituminous coal used; av. cost, $4.44 to $5.13 per short ton. RESERVOIRS.—Cap., 152,000,000 galls. Low Service: Sockanosset, 51,000,000; 180½ ft. above mean high tide in Providence River, 156 ft. above pumping station; Hope, 76,000,000; 162½ ft. above datum. High Service: Fruit Hill, 25,000,000; 274¾ ft. above datum; showed leaks after completion and has undergone extensive repairs. STAND-PIPE—Cap., 69,000 galls.; iron 8 × 184 ft. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 294 miles, including 45½ miles in suburbs (in '94); cost extensions met by appropriations. Taps, 18,695; made by city. Services, lead; paid for by city to curb. Meters: 13,763; owned by consumer; controlled by city; repairs made by city and at expense of consumer. Use of meters, compulsory for nearly all but domestic services and certain also of that class. City can compel the use of meters and any consumer may have one. Hydrants, public, 1,680. CONSUMPTION.—(Galls.) av., 8,905,085; max., 12,022,000. PRESSURE.—Ordinary, 39-86 lbs., high service; 39-73 lbs., low service. Steam fire engines are used. FINANCIAL.—Cost, $6,119,430. Debt, $6,985,691: Floating, $185,691, at 5%; Bonded, $820,000, at 6%, due 1900; $3,180,000, at 5%, due 1900; $1,500,000, at 5%, due 1906; $483,000, at 3½%, due 1916; $817,000, at 4%, due 1923. Sinking Fund: $1,177,237, invested in city bonds and notes. Expenses: Operating, $72,091; int., $339,176; taxes, $7,275. Revenue: Consumers, unmetered, $106,439; metered, $358,784; City, fire protection, $27,106; street sprinkling, $3,593; public buildings, $5,703. No charge for sewer flushing has been made but will charge for the water in the future. Water-works are self-supporting. MANAGEMENT.—Comr. Pub. Wks., Robt. E. Smith; Secy., Walter F. Slade; City Treas., D. L. D. Granger; City Engr., J. Herbert Shedd; Asst. Engr. in Charge Water-Works, Edmund B. Weston; Ch. Pump. Engr., Geo. B. Arnold. Rept. by Secy., June 8. PROJECTED IMPROVEMENTS.—A separate system for fire protection is under construction. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, May 14, 21, '81; Apr. 24, '86; Aug. 11, '88; Apr. 20, '93. Water purification: June 28, July 19, Aug. 16, 30, '94; Oct. 24, '95; Apr. 16, 23, '96. Pumps: Oct. 12, 19, Nov. 16, 30, '93; Sept. 27, '94; Apr. 2, '96. Meters: Mar. 5, '92; Apr. 20, '93.

11, 13. **RIVER POINT,** Kent Co. Supply from Phenix, and from Wakefield.

13. **ROCKY BROOK** (P. O. Peacedale), Washington Co. (Est., 57.) Supply from Wakefield.

13. **SOUTH KINGSTON,** Washington Co. Supply from Wakefield.

P 2. **TIVERTON,** Newport Co. (2,837.) Works projected by Norman Bros., Newport, R. I., for construction in '97-8. Supply, Noquit Pond, and Sin and Flesh Brooks, pumping to reservoir. Est. cost, $250,000. Rept. by Reginald Norman, Dec. 21, '96.

10. **VALLEY FALLS,** Providence Co. Supply from Pawtucket.

13. **WAKEFIELD,** Washington Co. (Est. 2,170.) Built in '88-9 by Wakefield City Water Co. Supplies also villages of Rocky Brook and Peacedale, town of South Kingstown and District of Narragansett. This territory apparently includes Narragansett Pier and River Point. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $30 or $45 per hydrant according to term. SUPPLY.—Impounding

reservoirs on Rocky Brook, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington: one comp. non-cond., one simple high pressure. Bituminous coal used; av. cost, $5.25 per short ton delivered. FILTERS.—Cap., 150,000 galls. National (or New York). RESERVOIRS.—Cap., 40,000,000 galls. Two impounding reservoirs. STAND-PIPE.—Cap., 290,000 galls.; iron; 30 × 55 ft., 190 ft. above tide. Area supplied (in '89), 10 to 60, and at extreme points, 180 ft. above tide. FISCAL YEAR CLOSED Jan 1. DISTRIBUTION.—Mains, 14½ miles; cost extensions met by receipts. Taps, 480; made by Co., free. Services, lead; paid for by Co. to curb. Meters: 29; owned, controlled and repaired by Co. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 87; private, 15. CONSUMPTION.—(Galls.) av., 250,000; max., 600,000; min., 150,000. PRESSURE.—Ordinary and fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Dumont Clark, New York, N. Y.; Secy. and Treas., A. B. Richards, New York, N. Y.; Mgr., Willard Kent; Ch. Pump. Engr., T. P. Sheldon. Rept. by Mgr., June 16. SEWERS.—Has sanitary and storm sewers.

3. **WARREN,** Bristol Co. (4,489.) Supply from Bristol.

14. **WARWICK AND COVENTRY,** Kent Co. (Warwick, 17,761; Coventry, 5,068.) Built in '90-1 by Warwick & Coventry Water Co. Supplies Arctic and Washington. FRANCHISE.—20 yrs. Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes for five years. Co. has three contracts, one with Warwick Fire Dist. to run 20 yrs., one with Coventry Fire Dist. to run 10 yrs. and one with Crompton Fire Dist. to run 10 yrs. First two have run about four years already, last about three years. SUPPLY.—Carr Pond, by gravity, to stand-pipe. RESERVOIRS.—Cap., 276,760,000 galls. Storage, Carr Pond, artificially raised. STAND-PIPE.—Cap., 470,000 galls.; iron, 40 × 50 ft. DISTRIBUTION.—Mains, not given; cost extensions met by income. Taps, 600; made by Co. Services, galv. i.; paid for by Co. to curb line. Meters, 95; owned by consumer; controlled by Co.; repairs paid by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 191; private, 7. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary (in '90), 80 lbs. FINANCIAL.—Cap. Stock: authorized, $100,000; paid-up, $50,000. Bonded debt, $215,000, at 5%. Revenue, city, fire protection, $5,940. MANAGEMENT.—Prest. and Treas., John J. Arnold, Phenix; Secy. and Supt., Herbert B. Barton, Centerville. Rept. by Supt., Aug. 13. SEWERS.—None.

14. **WASHINGTON,** Kent Co. Supply from Warwick.

15. **WESTERLY,** Washington Co. (6,813.) First supplied in '76 by Co.; present works built in '86 by Westerly Water-Works Co., and extended to Pawcatuck, Conn., in '87. FRANCHISE.—25 yrs. from '85; provides for purchase of works by city in 1911; price to be determined by board of three, chosen by town and Co. Rates are not fixed in franchise nor subject to regulation by city. City to pay for ten drinking fountains, for fire protection and supply for town hall. LEGAL DIFFICULTIES.—According to numerous press repts. steps were taken about '91 by both town and Co. for purchase of works by town. Agreement as to price not being reached, town voted in '95 to build works, and let contracts for same. Co. took matter into courts, and after decisions in lower courts in favor of town, Co. secured temporary injunction in U. S. Circuit Court in June, '96. Up to Oct., '96, matter was still in courts. SUPPLY.—Shunoc Brook, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls; 2—875,000 Worthington comp. dup. In addition, 2—1,000,000-gall. Worthington vert. comp. cond. rept. by makers late in '96. Bituminous coal used; av. cost, $4 per short ton, delivered. FILTERS.—Cap., 1,500,000 galls.; New York, mechanical. STAND-PIPE.—Cap., 372,000 galls.; 30 × 70 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 18¼ miles. Taps, 849; made by Co. Services, lead; paid for by Co. to curb line. Meters: 622; owned by consumer; controlled by Co.; repairs paid for by consumer. Use of meters optional with consumer. Hydrants, public, 17 (in Conn. Dist.); private, 31. CONSUMPTION.—(Galls.) av., 375,000. PRESSURE.—Ordinary, 93 lbs. Steam fire engines are used in R. I. Dist. where there are no hydrants. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jonathan Chace, Valley Falls; Treas., Chas. Perry; Supt., Everett Barnes; Ch. Pump. Engr., Francis T. Brightman. SEWERS.—None.

16. **WOONSOCKET,** Providence Co. (20,830.) Bought by city Apr. 1, '85, for $289,-613; built in '84 by Co. In '91 works were extended to supply Manville fire district, under a 10-yr. contract calling for 27 hydrants at the start at an annual rental of $30 each. SUPPLY.—Crook Falls Brook, pumping to stand-pipes. Drainage area, 7.9 sq. miles. PUMPS.—Cap., 4,500,000 galls.; all low duty. Worthington dup., 1,000,000, and comp. dup., 1,000,000; Deane comp. dup., 2,500,000. Coal; av. cost, $3.87 per short ton. RESERVOIRS.—Cap., 580,000,000 galls. No. 1, 30,000,000 galls.; No. 2, 25,000,000 galls.; No. 3, 525,000,000 galls., located in Lincoln and North Smithfield. STAND-PIPES.—Cap., 1,026,000 galls.; three, each of iron; No. 1, 264,000, 30 × 50 ft.; No. 2, 360,000, 35 × 50 ft.; No. 3, 402,000, 30 × 76 ft. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 41 miles; cost extensions met by appropriations. Taps, 1,847; made by city, free. Services, lead; paid for by city to curb. Meters: 1,590; owned, controlled and repaired by city. Hydrants, public, 491; private, 74. CONSUMPTION.—(Galls.) av., 621,464; max., 1,058,092; min., 376,520. PRESSURE.—Ordinary and fire,

95 lbs. Steam fire engines are used in certain districts. FINANCIAL.—Cost, $644,144. Expenses: Operating, $10,555; int., $18,055. Revenue: City, fire protection, $14,872; other purposes, $3,999. MANAGEMENT.—Three Comrs. Ch. Pump. Engr., A. Wagner. Rept. by Supt., Byron I. Cook, June 8. SEWERS.—None.

CONNECTICUT.

1, 2. **ANSONIA,** New Haven Co. (10,342.)

ANSONIA WATER CO.

Built in '69. FRANCHISE.—Does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. City to pay $28 per hydrant per yr. SUPPLY.—Naugatuck River and springs, by gravity. In '89, 500,000-gall. Deane pump in factory was used for fire protection, but supply has apparently been changed since then. RESERVOIR.—Cap., 250,000,000 galls.; four storage;first three rept. in '89 as having cap. of 83,000,000 galls.; new one built in '95. DISTRIBUTION.—Mains, 10 miles. Taps, about 700. Hydrants, 73. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $200,000. Paid 5% div'd. Bonded debt, $45,000, at 6%. MANAGEMENT.—Prest., Treas. and Supt., Dana Bartholomew; Secy., Theo. L. Bristol. SEWERS.—Has sanitary and storm sewers.

FOUNTAIN WATER CO.

Built in '72. Supplies West Ansonia. SUPPLY.—Springs, by gravity from reservoir. DISTRIBUTION.—Mains (in '90), 14 miles. Taps (in '90), about 588. Meters 16; owned by Co. Use of meters compulsory for saloons and livery stables. Hydrants, public, 41; private, 1. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—(In '90). Cap. Stock, authorized, $20,000; all paid-up; paid 6% div'd in '90. No bonds. Expenses, $1,583: Operating, $1,200; int., $250; taxes, $133. Revenue, City, $680. MANAGEMENT.—Prest., David Torrence, Derby; Secy., Treas. and Supt., J. A. Fish. Engr., D. C. Sanford, New Haven. Rept. by Supt., July 22. SEWERS.—Has sewers. REFERENCE—Eng. News, Apr. 17, '86.

12. **BELL HAVEN,** Fairfield Co. Supply from Greenwich.

3. **BETHEL,** Fairfield Co. (2,335.) Built in '78 by borough. SUPPLY.—Stream, by gravity, from impounding reservoir. In '92 deficient supply was supplemented by laying 10-in. c. i. pipe about 1,600 ft. through narrow ravine to a natural pond; Engr., J. K. Wilkes, New Rochelle, N. Y. FILTER.—Sand and gravel bed; area, 13,000 sq. ft.; just below reservoir dam. RESERVOIR.—Cap., 96,000,000 galls.; 175 ft. above, 1½ miles from village. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 14 miles; cost extensions met by water rents. Taps, 614. Services, galv. i. and lead; paid for by property owner. Meters: 0; borough can compel the use of meters and any consumer may have one. Hydrants, 82. CONSUMPTION.—(Galls.) av., 850,000. PRESSURE.—Ordinary, 75 lbs.; fire, 75 lbs. One steam fire engine is owned by borough but not used. FINANCIAL.—Bonded debt, $65,000: $40,000 due '98; $8,000, at 6%, due 1918; $9,000, at 6%, due 1908; $8,000, at 6%. Sinking Fund: $1,500, invested at 4%. Expenses, $3,315: Operating, $1,200; int., $2,100; taxes, $15. MANAGEMENT.—Prest., E. C. Oakley; Secy., A. W. Twiss; Treas., S. S. Ambler. Rept. by Supt., Chas. H. Hart, July 30. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Mar. 11, '82. Filtration, Mar. 7, '91; Aug. 30, '94.

4. **BIRMINGHAM** (P. O. Derby), New Haven Co. (4,413.) Built in '60 by Birmingham Water Co., which also supplies Derby. SUPPLY.—Springs and surface water, by gravity from reservoirs. A 1,000,000-gall. Worthington comp. cond. rept. by makers; according to press rept. this was placed in '92 for emergency use. RESERVOIRS.—(In '89.) Two impounding reservoirs formed by dams, with areas of 27 and 9 acres, respectively. Supply main (in '89), 12 and 8-in., 2,054 ft. long. DISTRIBUTION.—Mains, 10 miles. Taps, 400. Hydrants, 64. PRESSURE. — Ordinary, 60 to 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Wm. B. Wooster; Secy., David Torrance; Treas., Chas. H. Nettleton. SEWERS.—None. REFERENCE.—Eng. News, Oct. 1, '81.

P 1. **BRANFORD,** New Haven Co. (4,460.) Reported Jan. 16, '97, that Branford Electric Light Co. would apply to the Legislature this winter for a charter to build water-works.

5. **BRIDGEPORT,** Fairfield Co. (48,866.) First supplied in '18 by the Rev. Elijah Waterman; in '53 Nathaniel Green built works, which in '57 passed to Bridgeport Hydraulic Co. In '86 the Citizens' Water Co. started works. Old Co. secured injunction preventing bringing supply into city. In '88 Cos. consolidated. Supplies Easton. FRANCHISE.—Perpetual as long as Co. gives good supply. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $12,500 for public service. Contract with city is renewed every five years. SUPPLY.—Pequonnock, Mill and Horse Tavern Rivers, by gravity and pumping. PUMPS.—Cap., 15,000,000 galls. Two Worthington comp. cond., 5,000,000 and 10,000,000. Coal, av. cost, $3.55 per short ton. RESERVOIRS.—Cap., 2,186,000,000 galls. Storage, impounding and distributing as follows: 167,000,000, 128,000,000, 200,000,000, 11,000,000, 200,000,000, 10,000,000, 20,000,000, 300,000,000, 250,000,000, 900,000,000. FISCAL YEAR CLOSED May 31.

DISTRIBUTION.—Mains, 100 miles; cost extensions met by earnings. Taps, 7,000; made by Co. for $3.50. Services, lead and iron; paid for by owner of property. Meters: 157; owned, controlled and repaired by Co. Use of meters compulsory for factories, livery stables, etc. Co. has not as yet furnished any meters for private houses. Expect to meter saloons and eventually all consumers. Hydrants, public, 445; private, 12. CONSUMPTION.—(Galls.), 16,000,000. PRESSURE.—Ordinary, 25-50 lbs. Six steam fire engines are used. FINANCIAL.—Cap. Stock: authorized, $1,000,000; all paid-up. Floating debt, $50,000, at 5%; Bonded, $200,000, at 6%, due 1902; $100,000, at 5%, due '98, $100,000, at 5%; due '99. MANAGEMENT.—Prest., Chas. Sherwood, 29 John St.; Secy., Franklin C. Smith; Treas., T. B. De Forest; Supt., Geo. Richardson. Rept. by Prest., Aug. 8. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Jan. 27, '83. New Co. works, Apr. 9, '87.

6. **BRISTOL,** Hartford Co. (7,382.) Built in '85 by Bristol Water Co. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Green Meadow and Poland Brooks, by gravity from impounding reservoirs. RESERVOIRS.—Cap., 157,000,000 galls.; Green Meadow, 55,000,000; Poland, 100,000,000, another of 2,000,000. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains (in '91), 16 miles. Taps, 700. Services, galv. i.; paid for by consumer. Meters: 27; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for manufacturers, livery stables, etc. Hydrants, public, 68; private, 9. PRESSURE.—Ordinary, 60-130 lbs. FINANCIAL.—Cost (in '90), $126,275. Cap. Stock: Authorized, $100,000; all paid-up. MANAGEMENT.—Prest., J. H. Sessions; Secy. and Treas., C. S. Treadway. Supt., T. H. Keirns. Rept. by Secy., June 8. SEWERS.—Has sanitary and partial system of storm sewers.

7. **CANAAN,** Litchfield Co. (970.) Built in '79 by Canaan Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Springs, by gravity from impounding reservoir. RESERVOIR.—Cap., 750,000 galls. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 5 miles. Taps, 160. Services, iron; paid for by owner of property to sidewalk line. Meters, 0. Hydrants, 6. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock, authorized, $5,000; all paid-up. Expenses: Operating, $300; taxes, $75. Revenue (in '90): Consumers, $1,012; City, none. MANAGEMENT.—Prest., Chn., Luman Foote; Secy. and Supt., Saml. A. Eddy; Treas., J. W. Peet. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—Increasing capacity of reservoir. SEWERS.—None. REFERENCE.—Eng. News, Dec. 9, '82.

P 2. **CHESTER,** Middlesex Co. (1,301.) Chester Water Co., incorp. in '95. Proposed supply, Waterhouse Pond, by gravity. Est. cost, $35,000. Engr., Churchill Hungerford, 5 Beekman St., New York city. Rept. by E. C. Hungerford, Nov. 10, '96.

8. **DANBURY,** Fairfield Co. (16,552.) Present works built in '61 by borough. First supplied in '33 by Danbury Water Co. SUPPLY.—Surface water, by gravity, from impounding reservoirs. (1,300,000-gall. Worthington non-comp. high pressure pump rept. by maker.) RESERVOIRS.—Cap., 800,000,000 galls. Four storage. DISTRIBUTION.—Mains, 60 miles; cost extensions met by rentals. Services, iron; paid for by city. Meters: 67; owned, controlled and repaired by city. Use of meters, compulsory for livery stables and saloons. City can compel use of meters and any consumer may have one. Hydrants, 325. PRESSURE.—Ordinary, 70 lbs.; fire, 55 lbs. Steam fire engines are used. FINANCIAL.—Cost, $500,000. Debt, $250,000. Expenses: Operating, $4,000. Revenue: Consumers, $38,000; City, fire protection, free; sewer flushing, free. Rept. by Supt., Geo. C. Stevens, June 13. SEWERS.—Has sanitary and storm sewers. REFER- State St., Boston, Mass., Oct. 5. SEWERS.—None.

9. **DANIELSONVILLE,** Windham Co. (Not given.) Built in '86 by Crystal Water Co., under perpetual charter. SUPPLY.—Higgins Brook, by gravity, from impounding reservoir. RESERVOIRS.—15,890,000 galls. Impounding, three miles and a half from borough, for domestic supply, 15,135,000 galls. Fire Reservoir, half mile from borough, 755,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 11 miles. Taps, 413; made by Co., free. Services, galv. i.; paid for by Co. to street line. Meters: 12; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical purposes. Hydrants, 54. PRESSURE.—Ordinary, 50-55 lbs.; fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $139,675. Cap. Stock: Common, paid-up, $60,000. Pref'd, paid-up, $20,000. Bonded debt, $55,000, at 5%. Sinking Fund, invested in bonds of Co. MANAGEMENT.—Prest., T. E. Hopkins; Secy. and Supt., Geo. S. Brown; Treas., Elbert Wheeler, 24 Washington St., Boston, Mass. Rept. by William Wheeler, Supervising Engr., 89 State St., Boston, Mass., Oct. 5. SEWERS.—None.

P 3. **DARIEN,** Fairfield Co. (2,276.) Darien Water Co., incorp. in '93 and later started to build works. Complications arose which prevented completion of works. Press rept. in fall of '96 stated that rights had been sold to Stamford Water Co., which would immediately introduce works.

4. **DERBY,** New Haven Co. (5,969, town.) Supply from Birmingham.

D 1. **DURHAM,** Middlesex Co. (856.) Built in 1798; rebuilt in '32 by Durham Aqueduct Co., which (in '89) consisted of heads of about 40 families. Supply, Cold spring, by gravity. In '90 there were 2 miles mains, 41 taps, nominal expenses and no revenue.

10. **EAST HARTFORD,** Hartford Co. (4,455.) Built in '92 by East Hartford Water Co.; put in operation Jan. 1. Engr., C. L. Goodhue, Springfield, Mass. FRANCHISE.—Unlimited; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Salom brook, by gravity. RESERVOIR.—Distributing; area, 3 acres. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 25 miles. Taps, not given; made by Co., free. Services, iron; paid for by property owner. Hydrants, public, 60; private, 7. FINANCIAL.—Cap. Stock: Common, authorized, $200,000. Bonded debt, $136,000 at 5%, due in 1925; payable in 1905 at option of Co. MANAGEMENT.—Prest., Percy S. Bryant; Secy., Arthur C. Siebert; Supt., Arthur P. Moore. Rept. by Prest., Dec. 8. SEWERS.—Has partial systems of sanitary and storm sewers.

P 4. **EAST LYME,** New London Co. (2,048.) Works projected by Co., with supply from lake. Est. cost, $30,000. Engr., L. Duball, New London. Address Calvin S. Davis.

41. **EAST NORWALK,** Fairfield Co. Supply from South Norwalk.

5. **EASTON,** Fairfield Co. Domestic supply from Bridgeport.

252. N. Y. **EAST PORTCHESTER** (P. O. Portchester, N. Y.), Fairfield Co. Supply from Portchester, N. Y.

D 2. **ELLINGTON,** Tolland Co. (1,539.) Rebuilt in '93 by Francis M. Charter, present owner, for domestic supply only. Supply, springs, by gravity. Fiscal year closed Jan. 1, '96. Mains, 2 miles. Taps, 36. Service, lead; paid for by consumer. Meters, 0. Daily average consumption, 25,000 galls. Ordinary pressure, 22 lbs. Cost, $2,200. Operating expenses, $50. Rept. by Francis M. Charter, Nov. 10.

11. **FARMINGTON,** Hartford Co. (3,179.) Built in '81 by Farmington Water Co. SUPPLY.—Springs, by gravity from impounding reservoir. RESERVOIRS.—Cap., 50,000,000 galls. Impounding, 50,000,000; distributing, 300,000. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by revenue. Taps, 85; made by Co. Services, galv. i.; paid for by owner of property. Use of meters optional with consumer. Hydrants, public, 9; private, 2. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $20,000. Cap. Stock, paid-up, $20,000; paid 6% semi-annual div'd in '95. MANAGEMENT.—Prest., E. H. Deming; Secy., Treas and Supt., A. R. Wadsworth. Rept. by Supt., July 15. SEWERS.—Has sanitary sewers only.

D 8. **GRANBY,** Hartford Co. (1,251.) Built in '73 by Salmon Brook Water Co. evidently for domestic supply only. Supply, Bissell Brook, pumping to 2,500-gall. wooden tank. Mains, 1 mile. Services, iron; paid for by consumer. Meters, 0. Prest., Wm. C. Case; Secy., C. P. Loomis; Treas., J. N. Loomis. No sewers. Rept. by Secy., Jan. 8, '96.

12. **GREENWICH,** Fairfield Co. (10,131.) Built in '80 by Greenwich Water Co. under perpetual charter. In '84 works were extended to connect with distribution system at Port Chester, N. Y., from which, in turn, Rye and Harrison, N. Y., are supplied. Bell Haven, Conn., also supplied from Greenwich. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $30 per hydrant per annum. No legal difficulties. SUPPLY.—Putnam and Rockwood Lakes, by gravity. FILTERS.—Cap., 8,000,000 galls.; New York, mechanical. RESERVOIRS.—Cap., 625,000,000 galls. Rockwood Lake, 325,000,000; Putnam lake, 300,000,000. Supply main (in '89), 12-in. for 3 miles, then two 10-in., one 3 miles to Port Chester, other one mile to Greenwich. TANK.—Cap., 1,300,000 galls.; iron; 80 x 35 ft.; 2 miles from reservoir. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by earnings or bonds. Taps, 500; made by Co. Services, galv. i.; paid for by consumer. Meters, 25; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for all except small private consumers. Hydrants, public, 30; private 5. CONSUMPTION.—(Galls.) av., 400,000; max., 1,000,000 in summer. PRESSURE.—Ordinary, 40 lbs.; high service, 105 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., A. Foster Higgins; Secy., Geo. McNall; Treas., Wm. Rockerfellow; Supt., John Dayton; Filter Operator and Genl. Asst., Theo. Chard. Rept. by Wm. S. Bacot, Engr., 1 Broadway, New York city. SEWERS.—Has sanitary sewers.

44, P 5. **GROTON,** New London Co. (5,539.) Present supply from Stonington. Groton Water Co. was organized June 5, '91, to construct independent system, but as yet has done nothing further than make surveys and estimates. Has concluded that it would not be well to build works at Groton yet. Prest. Groton Water Co., E. L. Baker, who made rept. June 6.

18. **HARTFORD,** Hartford Co. (53,230.) Present works built in '54 by city. First supplied, probably in 1797, by Hartford Aqueduct Co. SUPPLY.—Brooks, by gravity from storage reservoir; also (in '90) emergency supply from Connecticut River, pumping direct, by means of 3,000,000 Wright pumps. RESERVOIRS.—Cap., 2,032,000,000 galls.: No. 1, 145,000,000, area about 30 acres, on Trout Brook; No. 2, 283,000,000, area, 44 acres, on Mine Brook; No. 3, 145,000,000, area, 25 acres, on branch about one mile

northwest of Trout Brook; No. 4, 600,000,000; No. 5, 94,000,000; No. 6, 765,000,000. Supply mains (in '89), two 20-in., each 25,948 ft. long, from reservoir No. 1 to city. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 95 miles; cost extensions met by earnings. Taps, 771; made by city. Services, galv. i.; paid for by city to curb. Meters, 464; owned, controlled and repaired by city. Use of meters optional with city. Hydrants, 621. CONSUMPTION.—(Galls.) av., 7,500,000. PRESSURE.—Ordinary, 35-50 lbs. Steam fire engines are used. FINANCIAL.—Cost, $2,556,000. Bonded debt, $970,000. Expenses: Operating, $43,000; int., $43,000. MANAGEMENT.—Prest. and Supt., John S. Hunter; Secy., J. Seymour Chase. Rept. by Secy., June 11. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 23, '81; May 19, '92.

14. **HAZARDVILLE,** Hartford Co. (Not given.) Built in '92 by Hazardville Water Co. Engr. and Contr., A. D. Bridge. SUPPLY.—Springs, by pumping to tanks. PUMPS.—Cap., 55,000 galls.; one wind engine, 20,000; one steam pump, 25,000; one power pump, 10,000. TANKS.—Cap., 80,000 galls.; two connected together; one 14×20, cap., 30,000, on 36-ft. tower; one 16 × 24, cap., 50,000, on 30-ft. tower. FISCAL YEAR CLOSED Jan. 1, '95. DISTRIBUTION.—Mains, 3 miles; cost extensions met by income. Taps, 150; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 13; private, 2. CONSUMPTION.—(Galls.) av., 20,000; max., 35,000; min., 8,000. PRESSURE.—Ordinary, 30 lbs. No fire engine used. FINANCIAL.—Cost, $20,000. Cap. Stock, authorized, $15,000; all paid-up. Bonded debt, $10,000, at 5%, due 1910. Expenses, $1,100: Operating, $550; int., $500; taxes, $50. Revenue, $2,400. MANAGEMENT.—Prest., Amos O. Bridge; Secy., Treas. and Supt., H. E. Bridge. Rept. by Secy. SEWERS.—None.

15. **JEWETT CITY,** New London Co. (Not given.) Built in '95 by Jewett City Water Co. Engr., Lorning N. Farnum, 53 State St., Boston, Mass. Contr., New England Pub. Wks. Co., New Haven. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,500 per yr. for 50 hydrants; 20-yr. contract. No legal difficulties. SUPPLY.—Impounding and storage reservoir, by gravity. RESERVOIRS.—Cap., 120,000,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 250; made by consumer for $4 each. Services, galv. i.; paid for by property owner. Hydrants, public, 50; private, 14. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Cost, $130,000. MANAGEMENT.—Prest., A. A. Young, Jr.; Secy., A. C. Ladd; Treas., C. H. Eglee, Flushing, N. Y. Rept. by Supt., A. C. Ladd, June 16. SEWERS.—None.

16. **KENT,** Litchfield Co. (1,883.) Built in '82 by Kent Water Co. SUPPLY.—Springs and surface water, by gravity from reservoir. RESERVOIR.—Cap., not given; area, 1½ acres; depth, 2 to 18 ft. DISTRIBUTION.—Mains, 2.3 miles. Taps, 40. Meters, 0. Hydrants, 10. FINANCIAL.—Cost, $15,500. No debt. Revenue: Consumers, $500; city, none. NOTE.—No report since '88 Manual.

17. **LAKEVILLE,** Litchfield Co. (Not given.) Built in '91 by city; put in operation July 1. Engr., J. K. Wilkes, New Rochelle, N. Y. Contr., Donato Cuozzo, New York City. SUPPLY.—Mountain stream, by gravity. RESERVOIRS.—Cap., 10,460,000 galls.; storage, 10,000,000; distributing, 460,000. DISTRIBUTION.—Mains, 7 miles. Taps, 200. Services, iron. Meters, 0. Hydrants, 20. CONSUMPTION.—Unknown. PRESSURE.—Above pressure regulator, 145 lbs.; below regulator, 85 lbs. FINANCIAL.—Cost, $48,000. MANAGEMENT.—Prest., A. F. Roberts; Secy and Treas., G. H. Knight. Rept. by J. K. Wilkes, New Rochelle, N. Y., Dec. 14. SEWERS.—None.

18. **LITCHFIELD,** Litchfield Co. (1,058.) Built in '89-90 by Co.; put in operation Oct., '90. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay $21.50 per hydrant per annum. No legal difficulties. SUPPLY.—Springs and surface water, by gravity from impounding and distributing reservoir. RESERVOIRS.—Cap., 11,000,000; impounding on Griswold Brook, 4½ miles from town; distributing, about ½ mile from town. STANDPIPE.—Cap., 197,000 galls.; iron, 30 × 37 ft., on masonry foundation; plates, iron, (rept. at time letting contract) ½ to ¼ ins. thick. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, not given; cost extensions met by income. Taps, not given; made by Co. Services, galv. i.; paid for by owner. Meters, 5; owned and controlled by Co. Use of meters optional with consumer; compulsory for stables, hotels and motors. Hydrants, public, 45; private, 8. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $71,500. Cap. Stock: Common, authorized, $40,000; all paid-up. Floating debt, $21,000, at 4½%. Expenses, $16,097: Operating, $15,000; int., $935; taxes, $162. Revenue: City, fire protection, $950; public buildings, $160. MANAGEMENT.—Prest., F. H. Wiggins, N. Y. City; Secy. and Treas., Chas. B. Bishop; Supt., E. B. Allen. Rept. by Supt., July 15. PROJECTED IMPROVEMENTS.—Auxiliary supply from driven wells. SEWERS.—Has sanitary sewers only.

19. **MANCHESTER,** Hartford Co. (8,222.) Built in '89 by Manchester Water Co. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay $1,200 for public service for specified number of hydrants; extra hydrants $25 per yr. No legal difficulties. SUPPLY.—Ponds and streams. RESERVOIRS.—Cap. not given; three reservoirs. DISTRIBUTION.—Mains, 12 miles. Services, galv. i.; paid for by consumer. Meters, 5; owned and repaired by Co. Use of meters not optional with consumer. Hydrants, public, 50; private, 4.

CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Wm. Foulds; Secy., Treas. and Supt., W. H. Childs, New York City. Rept. by Supt., July 20.

20. **MERIDEN,** New Haven Co. (21,652.) Built in '69 by city; greatly enlarged and improved in '91-2 and put in operation May 30, '92. Engr., Geo. H. Bishop. Contr., J. W. Buck & Co., all of Middletown. SUPPLY.—Surface water, pumping to distributing reservoir. Drainage area (in '92), about 4 sq. miles. PUMPS.—Cap., 5,000,000 galls.; Knowles. Cumberland coal used; av. cost, $5 per short ton. RESERVOIRS.—Cap., 489,000,000 galls.; storage: Kenmere and Merimere, 130,000,000 and 341,000,000; distributing, 18,000,000 galls. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 45 miles; cost extensions met by revenue. Taps, not given; made by city. Services, galv. i.; paid for by city to curb. Meters, 115; owned by city and consumer in about equal numbers; controlled by city; repairs paid mostly by city; yearly rental 10% of cost. Use of meters compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, 298. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 100 lbs. One steam fire engine is used on higher portions of the city. FINANCIAL.—Bonded debt, $330,000: $80,000 at 3½%; $250,000 at 4%. Expenses: Operating, $16,548; int., $12,700. Revenue: Consumers, $59,911; other purposes, $328. MANAGEMENT.—Water Comrs., Chn., L. J. Gaines; Supt., G. W. Miller. Rept. by Supt., Nov. 9. PROJECTED IMPROVEMENTS.—New 140,000,000 gall. storage reservoir now under construction. SEWERS.—Sanitary sewers now under construction. REFERENCES.—Eng. News, Nov. 26, '81. New reservoir, Jan. 30, '92.

21. **MIDDLETOWN,** Middlesex Co. (9,013.) Built in '66 by city. SUPPLY.—Surface water, by gravity from impounding reservoir. Drainage area (in '89), ⅛ sq. mile. RESERVOIRS.—Cap., 220,000,000 galls. Impounding and storage in adjoining town of Middlefield; area, 76 acres; av. depth, 10 ft.; 168 ft. above main business street, 45 ft. above highest residence section. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 24 miles; cost extensions met by revenue and if necessary by bond issue in addition. Taps, 1,650; made by city free. Services, w. i. and cement; paid for by city to curb line. Meters, 53; owned, controlled and repaired by city. Use of meters optional with city; compulsory for large consumers. Hydrants, 148. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,200,000; min., 800,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $301,926. Bonded debt, $55,000, at 3.65%, due 1915; $27,000, at 4%, due $2,000 each year; $20,000, at 4%, due 1908. Sinking Fund, $4,608. Paid $64,000 bonds on Jan. 1, '96. Expenses, $8,730: Operating, $4,711; int., $3,887; taxes, $132. Revenue, $29,423: Consumers, unmetered, $20,707; metered, $4,268; city, fire protection, $3,760; street sprinkling, $468; sewer flushing, $40; public buildings, $40; other purposes, $140. No general taxation; surplus carried to sinking fund. MANAGEMENT.—Prest. Water Bd., W. F. Burrows; Secy. and Supt., John C. Broatch. Rept. by Supt., June 18. PROJECTED IMPROVEMENTS.—In Dec., '96, people voted in favor of new reservoir, about 4½ miles from city. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, March 11, '82.

44. **MYSTIC,** New London (Est., 3,000.) Supply from Stonington.

22. **NAUGATUCK,** New Haven Co. (6,218, town.) Built in '88-9 by Naugatuck Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Straitsville Brook, by gravity. RESERVOIRS.—Cap., 107,000,000 galls.; distributing, in Naugatuck, 7,000,000; storage, in Prospect, 100,000,000. FISCAL YEAR CLOSED Feb. 2. DISTRIBUTION.—(In '90.) Mains, 12 miles. Taps, 175. Meters, 0. Hydrants, 63. FINANCIAL.—(In '90.) Cost, $85,000. Cap. Stock: Authorized, $45,000; paid-up, $44,425. Bonded debt, $39,500, at 6%. Expenses, $5,725: Operating, $3,200; int., $2,370; taxes, $155. Revenue, $5,000. MANAGEMENT.—Prest., Wm. Ward; Secy., Treas. and Supt., E. C. Barnum. Rept. by Supt., June 16.

23. **NEW BRITAIN,** Hartford Co. (19,007.) Built in '57 by city. SUPPLY.—Shuttle Meadow Brook, by gravity. Drainage area, about 2⅛ sq. miles. New 24-in. supply main laid in '92. RESERVOIR.—Cap., 1,700,000,000 galls. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 55 miles; cost extensions met by receipts or guarantee of 8%. Taps, 2,850; made by city, free. Services, iron and lead; paid for by owner. Meters, 155; owned, controlled and repaired by city. Use of meters optional with city; compulsory for blocks, factories and stables. Hydrants, public, 289; private, 30. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 95 lbs.; fire, 80 lbs. Steam fire engines are used at large fires. FINANCIAL.—Sinking Fund, $70,000. Expenses, $48,050: Operating, $32,000; int., $16,000; taxes, $50. Revenue: City, fire protection, $7,000; street sprinkling, $100. MANAGEMENT.—Chn., Thos. S. Neall; Secy., P. J. Egan, Box 050: Operating, $32,000; int., $16,000; taxes, $50. Revenue: City, fire protection, $7,000; sewers. REFERENCE.—Eng. News, July 8, '82.

24. **NEW CANAAN,** Fairfield Co. (2,701.) Built in '95 by New Canaan Water Co. Engr., L. M. Farnum, Boston, Mass. Contrs., New England Pub. Wks. Co., New Haven. Borough to pay $1,000 and the town $300 per yr. SUPPLY.—Five-Mile River. RESERVOIR.—Cap., 40,000,000 galls.; impounding. DISTRIBUTION.—Mains, 7 miles. Taps made by Co. Services paid for by consumer. Meters, 0. Use of meters optional with

consumer. Hydrants, 38. CONSUMPTION.—(Galls.) av., not known. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cap. Stock, authorized, $50,000; all paid-up. Bonded debt, $30,000, at 5%. Expenses: Int., $1,500. Revenue: City, fire protection, $1,000. MANAGEMENT.—Prest., L. M. Monne; Secy., Wm. E. Pardee, New Haven; Treas., E. H. Phipps; Supt., F. Wolfel. Rept. by Prest., June 10. SEWERS.—None.

25. **NEW HARTFORD**, Litchfield Co. (3,160.) Built in '94 by New Hartford Water Co.; put in operation in Oct. Engr. and Contr., J. T. Langford, 70 Kilby St., Boston, Mass. FRANCHISE.—10 yrs. from '94; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental only, with the right to extend contract 10 yrs. No legal difficulties. SUPPLY.—South Mountain Brook, by gravity from impounding reservoir. RESERVOIR.—Cap., 2,000,000 galls.; formed by masonry dam. DISTRIBUTION.—Mains, about 8 miles; cost extensions met by Co. Taps, 250; made by Co. Services, iron; paid for by property owner. Meters owned, controlled and repairs paid by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 0. PRESSURE.—Ordinary and fire, 120 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock: Common, authorized, $30,000; all paid-up. Bonded debt, $30,000, at 5%, due in 30 yrs. MANAGEMENT.—Prest., Robt. R. Smith; Secy., E. E. Dow; Treas. and Supt., J. T. Langford. Rept. by Supt., Jan 5. SEWERS.—None.

26. **NEW HAVEN**, New Haven Co. (81,298.) Built in '60-2 by New Haven Water Co. In '76 village of Fair Haven become part of city and plant of Fair Haven Water Co. was then or has since been bought by New Haven Water Co. No legal difficulties. SUPPLY.—Lakes Whitney, Saltonstall, Chamberlain, Bethany, Wintergreen, Dawson and Maltby, pumping to reservoirs. Lake Whitney formed by dam on Mill River, above which is drainage area of 56 sq. miles. PUMPS.—Cap., 25,000,000 galls. High duty hor. comp. Worthington, 10,000,000; comp. cond. Worthington, 6,000,000; Yale Iron Works, 6,000,000; Farrell Foundry Co., 3,000,000. RESERVOIRS.—Cap., 3,517,000,000 galls. Two distributing, 10,000,000 and 7,000,000; seven storage, 3,500,000,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 150 miles. Taps, no record; made by Co for $4. Services, galv. i.; paid for by consumer. Meters, 200; owned by Co. and consumer; controlled and repaired by Co. Use of meters optional with consumer, except compulsory for factories, laundries, etc. Hydrants, 800. CONSUMPTION.—(Galls.) av., 13,700,000; max., 17,000,000; min., 12,000,000. PRESSURE.—Ordinary, 25 to 80 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, $2,000,000. No debt. Revenue: City, $20,000. MANAGEMENT.—Prest., Eli Whitney; Secy., Ellsworth I. Foote; Treas., A. F. Hemingway; Supt., Edward Dillon; Ch. Pump. Engrs., M. Villazon and P. N. Nickerson. Rept. by Secy., June 10. PROJECTED IMPROVEMENTS.—Acquiring property at present to connect Farm River with Lake Saltonstall. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 17, '81.

D 4. **NEWINGTON**, Hartford Co. (963.) Built in '66 by Newington Water Co. for domestic supply. Supply, stream or springs on Cedar Mt., by gravity. Mains, 2½ miles. Taps, 33. Cap. stock, $8,000. No rept. since '90-1 Manual.

27. **NEW LONDON**, New London Co. (13,757.) Present works built in '72 by city; first supplied in '02 by Aqueduct Co. SUPPLY.—Lake Kenomac, by gravity, with pumping to tank for high service. Drainage area, 1½ sq. miles. Supply main, laid '89-90, 20-in. c. i., 126,165 ft. long. PUMPS.—Hydraulic motor, made by Lang, Goodhue & Co., Burlington, Vt.; on 20-in. main, utilizing pressure of low service. Force main, 10-in. RESERVOIR.—Cap., 600,000,000 galls. Impounding; area, 225 acres; 6 miles from city and 180 ft. above tide. TANK.—Cap., 95,500 galls.; iron, 25 x 26 ft., on lattice tower 68½ ft. high. Total height, 214½ ft. above tide water. FISCAL YEAR CLOSED Sept. 1, '95. DISTRIBUTION.—Mains, 48 miles; cost extensions met by income. Taps, 2,663; made by city. Services, lead; paid for by city. Meters, 167; owned, controlled and repaired by city; yearly rental 10% of cost. Use of meters compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 198; private, 5. CONSUMPTION.—(Galls.) av., 1,244,000. PRESSURE.—Ordinary, 50 lbs. Steam fire engines are used occasionally. FINANCIAL.—Cost, $577,537. Bonded debt, $250,000, at 7%; $116,000, at 4%; $60,000, at 4%. Expenses, $31,249: Operating, $6,709; int., $24,540. Revenue, consumers, $38,634. MANAGEMENT.—Prest., Benj. A. Armstrong; Secy., Edward T. Brown; Supt., W. H. Richards. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—Additional supply for manufacturing purposes. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, Aug. 6, '81. Tank and pumps, Jan. 19, '93, illus.

28. **NEW MILFORD**, Litchfield Co. (3,917.) Built in '74 by New Milford Water Co. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Mountain stream, by gravity from impounding reservoir. Drainage area (in '89), about 1,100 acres. RESERVOIRS.—Cap., 14,500,000 galls. Two distributing, 3,500,000; one storage, 11,000,000. FISCAL YEAR CLOSED Aug. 1, '95. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by revenue. Taps, 248; made by Co. Services, galv. i.; paid for by consumer. Hydrants, public, 36. PRESSURE.—Ordinary, 80-100 lbs. FINANCIAL.—Cost, $49,301. Cap. Stock, common, authorized, $50,000; paid-up, $40,000; paid 6% div'd in '95. Preferred, none. Bonded debt, none. Expenses: Operating, $929; taxes, $180. Revenue:

City, fire protection, $676. MANAGEMENT.—Three Comrs. Prest., Chas. H. Booth; Secy. and Treas., Chas. H. Noble; Supt., H. O. Warner. Rept. by Secy., June 11, PROJECTED IMPROVEMENTS.—New storage reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 3, '82.

29. **NORFOLK,** Litchfield Co. (1,546.) Built in '95 by Norfolk Water Co.; put in operation in June. Engr., Geo. H. Peirson. Contrs., Babcock, Lary & Co. and H. J. Reilly. FRANCHISE.—10 yrs. from March 1, '96; provides for purchase of works by city. Co. is exempt from local taxes. City to pay $2,000 per yr. No legal difficulties. SUPPLY.—Lake Waugum, by gravity. FISCAL YEAR CLOSED Aug. 4. DISTRIBUTION.—Mains, 8 miles; cost extensions met by Co. Taps, 85; made by Co. for $5. Services, lead and iron; paid for by consumer. Hydrants, public, 42; private, 2. PRESSURE.—Ordinary, 30 lbs.; fire, 200 (?) lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., F. M. Shepard; Secy., Treas. and Supt., Edmund Brown. Rept. by Secy., Aug. 19.

30. **NORWALK,** Fairfield Co. (17,747.) Built in '72 by city. SUPPLY.—Silver Mine River, by gravity from impounding reservoir. Drainage area, 20 sq. miles. RESERVOIRS.—Cap., 110,000,000 galls. Two storage, 65,000,000 and 40,000,000 resp.; one distributing, 5,000,000. Main between reservoirs (in '89), 12-in. w. i. and cem., 6 miles long. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 25 miles; cost extensions met by earnings. Taps, 1,400; made by consumer. Services, w. i.; paid for by property owner. Meters, 15; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for users of boilers and motors. Hydrants, public, 130; private, 2. CONSUMPTION.—(Galls). av., 1,000,000; max., 1,400,000; min., 600,000. PRESSURE.—Ordinary, 75 lbs. One steam fire engine is used on high ground. FINANCIAL.—(In '90.) Cost, $280,000. Total debt, $250,000; Floating debt, $50,000, at 4%; Bonded, $200,000, at 4%. Expenses, $12,172: Operating, $2,172; int., $10,000. Revenue: Consumers, $13,356; street sprinkling, $150. No deficits. MANAGEMENT.—Bd. of Comrs.: John P. Treadwell, D. Warren Fitch, Frederick Mead; Secy., A. H. Camp; Supt., James Roach; Engr., C. N. Wood. Rept. by Engr., Sept. 18. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 12, '84.

31. **NORWICH,** New London Co. (16,156.) Built in '66-8 by city. SUPPLY.—Brooks and springs, by gravity from impounding reservoir. Drainage area (in '89), 1,233 acres. RESERVOIR.—Cap., 350,000,000 galls.; area, 66 acres. FISCAL YEAR CLOSED March 31. DISTRIBUTION.—Mains, 41 miles; cost extensions met by income. Taps, 3,150; made by city. Services, lead; paid for by city to property line. Meters: 86; 56 owned by city, balance by consumers; yearly rental 10% of cost. Use of meters compulsory for manufacturers, markets, stables, etc. City can compel use of meters and any consumer may have one. Hydrants, public, 313; private, 43. PRESSURE.—Ordinary, 75-90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $820,340. Bonded debt, $300,000: $150,000, at 6%, due '98; $150,000, at 5%, due 1908-10. Expenses, $36,980; Operating, $20,480; int., $16,500. Revenue, $50,653: Consumers, $49,077; City, none. MANAGEMENT.—Prest., C. J. Winters; Secy., I. E. Hill; Supt., R. S. Bartlett. Rept. by Supt., July 14. PROJECTED IMPROVEMENTS.—New reservoir. SEWERS.—Has sanitary sewers. REFERENCES.—Eng. News, July 30, 81; Oct. 26, '93.

15. R. I. **PAWCATUCK,** (P. O. Westerly, R. I.) New London Co. Supply from Westerly, R. I.

32. **PLAINVILLE,** Hartford Co. (1,993.) Built in '84 by Plainville Water Co. SUPPLY.—Surface water, by gravity from impounding reservoir with area of 63 acres. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 7 miles; cost extensions met by surplus. Taps, 200. Services, galv. i. Meters, 1; owned, controlled and repaired by Co. Use of meters compulsory for R. R. Hydrants, 30. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $31,900. Bonded debt, none. Expenses: Operating, $489; taxes, $160. MANAGEMENT.—Prest., W. L. Cowles; Secy., R. C. Usher; Supt., H. W. Higgins. Rept. by Secy., Oct. 5. SEWERS.—None.

39. **PLANTSVILLE,** Hartford Co. Supply from Southington.

33. **PORTLAND,** Middlesex Co. (4,687.) Built in '89 by Portland Water Co. CHARTER.—Perpetual; provides for purchase of works by city, price to be determined by arbitration or by commissioners appointed by court. SUPPLY.—Somasic Brook, by gravity from impounding reservoir. RESERVOIR.—Cap., 40,000,000 galls.; about 4 miles from town, area, 22½ acres. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 14 miles. Taps, 349; made by Co. free. Services, galv. i.; paid for by Co. to street line. Meters, 11; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical purposes. Hydrants, 81. PRESSURE.—Ordinary, 80 to 110 lbs. Steam fire engines are used. FINANCIAL.—Cost, $179,878. Cap. Stock, authorized, $100,000; all paid-up. Bonded debt, $73,000, at 5%. Sinking Fund invested in bonds of Co. MANAGEMENT.—Prest., Oliver Gildersleeve; Secy., Harry Gildersleeve, Jr.; Treas., Chas. F. Parks, 89 State St., Boston, Mass.; Supt., J. A. Butler; Supervising Engr., William Wheeler, 89 State St., Boston, Mass. Rept. by Sup. Engr., Oct. 5.

D 5. **PRESTON,** New London Co. (2,555.) Built by East Chelsea Aqueduct Co. about '55 for domestic supply only. Supplied (in '91) about 120 families. Supply, spring, by gravity.

34. **PUTNAM,** Windham Co. (6,512.) Built in '85-6 by Putnam Water Co. FRANCHISE.—Perpetual (or charter?) Provides for purchase of works by town at any time, price to be determined by arbitration. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Little River, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; two Worthington dup.; 1,000,000 water power, 750,000 steam. STAND-PIPE.—Cap., 237,930 galls.; iron, 30 × 45 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 15 miles. Taps, 637; made by Co., free. Services, galv. i.; paid for by Co. to street line. Meters, 34; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical purposes. Hydrants, 76. CONSUMPTION.—(Galls.) av., 350,000; max., 440,000; min., 250,000. PRESSURE.—Ordinary, 85-90 lbs. FINANCIAL.—Cost, $171,435. Cap. Stock, paid-up, $125,000. Bonded debt, $40,000, at 5%. Sinking Fund invested in bonds of Co. MANAGEMENT.—Prest., Lucius H. Fuller; Secy., Geo. E. Shaw; Treas., Elbert Wheeler, 24 Washington St., Boston, Mass.; Supt., C. Dwight Sharpe; Supervising Engr., Wm. Wheeler, 89 State St., Boston, Mass. Rept. by Supv. Engr., Oct. 5. PROJECTED IMPROVEMENTS.—New 1,250,000-gall. Deane steam pump, 60 HP. boiler and addition to pumping station, to be added in spring of '97. SEWERS.—Has storm sewers only.

P 6. **RIDGEFIELD,** Fairfield Co. (2,235.) Ridgefield Water Supply Co. was chartered in '93; in '94 Co. organized and had surveys, plans and estimates made, but not being able to secure a contract with the village construction has not been started. Rept. by Jas. E. Walsh, Aug. 17, '96.

35. **ROCKVILLE,** Tolland Co. (7,772.) Now owned by Rockville Water & Aqueduct Co. Built in '47 by Rockville Aqueduct Co.; enlarged in '66. In '93 Rockville Aqueduct Co. and Rockville Water Power Co. consolidated as Rockville Aqueduct & Power Co. New mains were laid in '93-4. Engr., H. W. Ayres, Hartford; Contr., C. H. Eglee, Flushing, N. Y. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrants and fountain. SUPPLY.—Shenipsit Lake, by gravity, with pumping to reservoir for high service. PUMPS.—Cap., 250,000 galls.; Deane dup. water power, operated by mill on stream. RESERVOIRS.—Cap., 113,000 galls.; high service for small portion of the town; 102 ft. above dam at lake. FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 17 miles. Taps made by Co. Services, lead; paid for by consumers. Meters, 118; owned, controlled and repaired by Co.; yearly rental, 10%. Use of meters optional with Co.; compulsory for high service consumers only. Hydrants, public, 111; private, 40. CONSUMPTION.—(Galls.) av., 20,000, high service; low service, unknown. PRESSURE.—Ordinary, 45 to 100 lbs. Two steam fire engines are owned by the town but are rarely used. FINANCIAL.—Cost, $225,000. Cap. Stock, authorized, $125,000; all paid-up. Bonded debt, $75,000, at 6%, due in 1923. Expenses: Operating, including taxes, $2,000; int., $4,500. MANAGEMENT.—Prest., A. Park Hammond; Secy. and Treas., I. C. Hammond, Jr. Rept. by Secy., June 8. SEWERS.—Under construction. REFERENCE.—Eng. News, July 18, '85.

36. **SHARON,** Litchfield Co. (2,149.) Built in '88 by Sharon Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay $200 per annum. SUPPLY.—Mountain brook, by gravity from impounding and distributing reservoir, area, 3¼ and 35 acres, resp. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 4 miles. Taps, 100. Services, iron; paid for by Co. Meters, 2; owned, controlled and repaired by Co. Use of meters optional with Co. Hydrants, 18. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock, authorized, $12,000; all paid-up; paid 4% div'd. Bonded debt, $7,000, at 5%. Expenses: Operating, $190; taxes, $50. Revenue: City, fire protection, $140; street sprinkling, $50; public buildings, $40. MANAGEMENT.—Prest., Milo B. Richardson, Lime Rock; Secy. and Treas., Willard Baker; Supt., Isaac N. Bartram. Rept. by Supt., July 8.

37. **SHELTON,** Fairfield Co. (1,952.) Built in '79-81 by Shelton Water Co. STATE CHARTER.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay $30 per hydrant per yr. No legal difficulties. SUPPLY.—Curtis Brook and springs, by gravity from impounding and distributing reservoirs. RESERVOIRS.—Cap., 77,000,000 galls. Impounding, 75,000,000; distributing, 2,000,000; ½ mile from, 230 ft. above town. Supply main (in '89), 12-in. c. i., 2,494 ft. long. FISCAL YEAR CLOSED May 16. DISTRIBUTION.—Mains, 7 miles. Taps made by Co. Services, galv. i.; paid for by consumer. Meters, 34; owned, controlled and repaired by Co.; no yearly rental. Use of meters compulsory for factories, livery stables and saloons. Co. can compel use of meters and any consumer may have one. Hydrants, public, 30; private, 14. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—(In '90.) Cost, $43,470. Cap. Stock: Authorized, $25,000; all paid-up; paid 6% div'd in '90. Floating debt, $12,600, at 6%. MANAGEMENT.—Secy. and Treas., Danl. S. Brinsmade. Rept. by Secy., June 6. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 15, '85.

38. **SIMSBURY,** Hartford Co. (1,874.) Built in '73 by Simsbury Water Co. SUPPLY.—Streams, by gravity from reservoir with area of one acre. Supply main, 6-in. iron, 1½ miles long. DISTRIBUTION.—(In '88) Mains, 2 miles. Taps, 50. Hydrants, 10. FINANCIAL.—(In 90.) Cost, $30,000. Cap. Stock, authorized, $30,000. NOTE.—No rept. since '90-1 Manual.

39. **SOUTHINGTON,** Hartford Co. (5,501.) Built in '83-4 by Southington Water Co.; supplies Plantville. Town owns 150 out of 600 shares of the Co.'s stock. FRANCHISE.—Does not provide for purchase of works by town. Rates are not fixed in franchise nor subject to regulation by town. Town to pay $20 per hydrant. SUPPLY.—Hunlston brook, by gravity from impounding and distributing reservoirs. Drainage area, about 2½ sq. miles. RESERVOIR.—Cap., 64,000,000 galls. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 14 miles. Taps, 500; made by Co. for $9. Services, galv. i.; paid for by consumer. Meters, 3; owned by consumer; controlled by Co. Use of meters optional with consumer. Hydrants, 74. PRESSURE.—Ordinary (in '89), 98 lbs. FINANCIAL.—Cost, $94,200. Cap. Stock, authorized, $60,000; all paid-up; paid 5% div'd in '95. Debt, $32,500, at 5%; Bonded, $32,500. Expenses: Int., $1,625; taxes, $347. Revenue, $7,000. MANAGEMENT.—Prest., E. E. Stow; Secy., Treas. and Supt., T. H. McKenzie. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—New reservoir and extensions of mains. SEWERS.—None. REFERENCE.—Eng. News, Sept. 5, '85.

40. **SOUTH MANCHESTER,** Hartford Co. (Est., 9,000.) Built in '91 by Cheney Bros., silk manufacturers, under name of South Manchester Water-Works Co. Engrs., Wm. E. Worthen, New York, and Henry W. Ayers, Hartford. No contr. SUPPLY.—Porter, Turey and other smaller brooks and springs, by gravity from impounding reservoirs. FILTERS.—Sand filter beds on Porter and Turey brooks, above Porter reservoir. RESERVOIRS.—Cap., 44,000,000 galls.; impounding, storage and distributing. Taylor reservoir, 9,000,000, 1½ miles from village; Porter reservoir, 35,000,000, 2½ miles from village. DISTRIBUTION.—Mains, 23½ miles, 12-in.; cost extensions met by Co. Taps, 900; made by Co. free. Services, tin lined lead; paid for by Co. Meters, 0. Hydrants, public, 0; private, 150; owned and maintained by Co. CONSUMPTION.—Unknown. PRESSURE.—Taylor res., 65 lbs.; Porter res., 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Frank Cheney; Secy. and Treas., Frank W. Cheney; Mgr., Chas S. Cheney. Rept. by Mgr., Jan. 21, '97. SEWERS.—Has sanitary and partial storm sewers.

41. **SOUTH NORWALK,** Fairfield Co. (Est., 4,875.) Built in '75 by town. East Norwalk supplied in '89 or '90 by laying main across harbor; cost about $12,000. SUPPLY.—Brooks and surface water, by gravity from three impounding reservoirs on streams. Drainage area, about 5 sq. miles. FILTERS.—Under investigation. RESERVOIRS.—Cap., 674,900,000 galls.; 162,900,000, 500,000,000 and 12,000,000. Gravel dike 800 ft. long across largest reservoir through which water passes; 16-in. main leads from this reservoir to city. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 26 miles; cost extensions met by excess receipts above interest and expenses. Taps, 1,200; made by property owner. Services, lead and iron; paid for by property owner. Meters: owned, controlled and repaired by city. Use of meters optional with city; compulsory for factories, hotels and R. Rs. Hydrants, 110. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $279,252. Bonded debt, $9,000, at 4%, due 1900; $40,000, at 6%, due 1905; $52,000, at 4%, due 1909; $12,500, at 4%, due 1910; $9,000, at 4%, due 1910; $47,500, at 4%, due 1911; $30,000, at 4%, due 1925. Expenses: Operating, $2,867; int., $9,142; taxes, $52. Revenue, $22,640. "Normal, $18,500." Works are more than self supporting. Normal excess about $8,000. MANAGEMENT.—Comrs., Chas. L. Trowbridge, Stephen S. Hatch, Lewis H. Nash; Treas., Edwin Wilcox. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, July 29, '82.

42. **STAFFORD SPRINGS,** Tolland Co. (2,353.) Built in '87 by Stafford Springs Water Co. under perpetual charter. FRANCHISE.—Does not provide for purchase of works by town. Rates are not fixed in franchise nor subject to regulation by town. SUPPLY.—Roaring Brook, by gravity from storage and distributing reservoir. RESERVOIR.—Cap., 25,000,000 galls; about 5 miles from, 285 ft. above village. FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 10 miles. Hydrants, 30. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary (in '89), 128 lbs. FINANCIAL.—Cost, Cap. Stock, $75,000. Debt, $86,200; Floating, $1,200, at 6%; bonded, $35,000, at 5%, due 1906. Expenses, $2,285: Operating, $279; int., $1,750; taxes, $218. Revenue, $3,185: Consumers, unmetered, $2,285; City, fire protection, $900. MANAGEMENT.—Prest., Alfred Birnie; Secy., A. S. Hicks; Treas., T. N. Birnie; Supt., Anthony Adams. SEWERS.—Partially sewered. Above inquiry returned endorsed "no change since last report." Above information as given in Manual for '90-1.

43. **STAMFORD,** Fairfield Co. (15,700.) Built in '60 by Stamford Water Co. SUPPLY.—Ripperram River, Trinity Lake and Mead Pond, by gravity. Trinity Lake has cap. of 300,000,000 galls.; 14 miles from Stamford, in Poundridge, N. Y. Water flows (in '89) in natural stream, 7 miles to Coxe's dam, thence in 16 and 12-in. conduit, 4 miles to reservoir. RESERVOIR.—Cap., 6,500,000 galls.; 170 ft. above tide water, 2 miles from town. Supply main, 16-in., two miles long. Reported that 2,000,000 Knowles pump was added in '90. FISCAL YEAR CLOSED Oct. 31, '95. DISTRIBUTION.—Mains, 50 miles. Taps, 2,082, made by Co. for $2. Services, lead; paid for by owner of property. Meters, 48; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, 125. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 70 lbs. Steam fire engines are used. FINANCIAL.—Cost, $453,684; Cap. Stock, Authorized, $400,000; paid-up, $360,000; paid 6% div'd. No preferred stock. Floating debt, $3,000, at 5%; Bonded, $70,000, at 5%, due 1917. Expenses, $15,732: Operating, $9,330; int., $3,494. Revenue,

(in '90), City, $2,000; taxes, $2,908. MANAGEMENT.—Prest., Chas. A. Hawley; Vice-Prest., A. J. Hatch; Secy., Walker Ferguson; Treas., Geo. H. Hoyt; Supt., Geo. E. Whitney. Rept. by Supt., July 22. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 17, '88.

44. **STONINGTON AND MYSTIC**, New London Co. (Stonington, 7,184; Mystic, est., 3,000.) Present works built in '88 by Mystic Valley Water Co., under perpetual franchise. Also supplies Groton. SUPPLY.—Mistuxel Brook, pumping from storage to distributing reservoirs. PUMPS.—Cap., 1,875,000 galls.; two Deane; dup. water power, 750,000; and comp. dup. steam, 1,125,000. RESERVOIR.—Impounding and storage, area, 12.8 acres; distributing, cap., 2,154,300 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 15.4 miles. Taps, 563; made by Co., free. Services, galv. i.; paid for by Co. to street line. Meters: 22; owned, controlled and repaired by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical purposes. Hydrants, public, 108; private, 10 (on R. R. property.) CONSUMPTION.—(Galls.) av., 294,878; max., 416,000; min., 230,600. PRESSURE.—Ordinary, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $261,495. Cap. Stock: Authorized, $140,000. Bonded debt, $110,000, at 5%. Sinking Fund, invested in bonds of Co. MANAGEMENT.—Prest., T. E. Packer, Mystic; Secy., Geo. E. Grinnell, Mystic; Treas. and Supervising Engr., William Wheeler, 89 State St., Boston, Mass.; Supt., A. G. Watrous, Mystic. Rept. by Supv. Engr., Oct. 5. SEWERS.—None.

45. **SUFFIELD**, Hartford Co. (3,169.) Under construction in '96 by Village Water Co. Engr. and Contr., Arthur R. Leete. SUPPLY.—Artesian well, pumping to standpipe. PUMPS.—Cap., 144,000 galls.; Downie. STAND-PIPE.—Cap., 350,000 galls.; steel, 25 × 80 ft. FINANCIAL.—Cap. Stock: Authorized, $30,000; paid-up, $20,000 MANAGEMENT.—Prest., Dwight S. Fuller; Secy. and Treas., Geo. F. Kendall. Rept. by Ch. Pump. Engr., Apollos Fuller, Sept. 3. SEWERS.—None.

D 6. **TAFTVILLE**, New London Co. (Not given.) Built in '92 by Ponemah Mills, principally to supply fire hydrants and sprinklers at mills, but a few families are supplied. Supply, impounding reservoir, by gravity. Rept. by J. Eccles, Supt. Mills.

46. **TERRYVILLE**, Litchfield Co. (Not given.) Built in '90-1 by Terryville Water Co. SUPPLY.—Springs, by gravity to reservoir. RESERVOIR.—Cap., 900,000 galls. DISTRIBUTION.—Mains, 3 miles. Hydrants, 7. NOTE.—No rept. since '90-1 Manual.

47. **THOMASTON**, Litchfield Co. (985.) Built in '80 by Thomaston Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise, nor subject to regulation by city. SUPPLY.—Springs, by gravity from impounding reservoir. RESERVOIRS.—Cap., 65,000,000 galls.; impounding, area, 11 acres. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by earnings. Taps; 180, made by Co., free. Services, galv. i.; paid for by owner of property. Meters, 6; owned, controlled and repaired by Co.; yearly rental, $2 to $4. Use of meters optional with consumer; compulsory for R. R. Co. and town buildings. Hydrants, public, 38; private, 5. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 130 lbs. FINANCIAL.—Cost, $44,500. Cap. Stock: Authorized, $40,000; paid-up, $36,000, paid 8% div'd. No preferred stock. Expenses: Operating, $574; taxes, $150. Revenue, $6,600: Consumers, unmetered, $2,450; City, fire protection, $600; public buildings, $250; other purposes, $3,300. No deficits. MANAGEMENT.—Prest., Aaron Thomas; Secy. and Supt., W. T. Woodruff; Treas., A. J. Hine. Rept. by Treas., July 16. SEWERS.—Has partial sanitary and storm system. REFERENCE.—Eng. News, Dec. 16, '82.

48. **THOMPSONVILLE**, Hartford Co. (Est., 4,673.) Built in '85 by Thompsonville Water Co. Supplies Warehouse Point, 9-mile extension having been made in '89. SUPPLY.—Springs, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Deane comp. cond. George's Creek coal used. RESERVOIRS. Cap., 1,000,000 galls. TANK.—Cap., 376,800 galls.; 40 × 40 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 20 miles. Taps, 900; made by Co. Services, iron; paid for by consumer. Meters, 1; owned by consumer. Use of meters optional with Co.; compulsory for one manufacturing Co. Hydrants, public, 48; private, 11. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 60 lbs. One steam fire engine is used. FINANCIAL.—(In '90.) Cost, $80,000. Cap. Stock, $50,000. No debt. MANAGEMENT.—Prest., Chas. H. Briscoe; Secy., S. H. Pease; Treas., C. S. Goodhue; Supt., H. R. Cooper. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—New pump. SEWERS.—Has sanitary sewers.

49. **TORRINGTON**, Litchfield Co. (4,283.) Built in '78 by Torrington Water Co. FRANCHISE.—Unlimited; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $15 per hydrant per annum. School-houses metered. No legal difficulties. SUPPLY.—Natural springs and streams, by gravity from impounding reservoirs. Drainage area (in '90), 8 sq. miles; apparently new area added since. RESERVOIRS.—Cap., 193,000,000 galls.; two impounding, in Goshen, 120,000,000 and 55,000,000; one distributing, in Torrington, 18,000,000. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 20 miles; cost extensions met by surplus and increased capital. Taps, 921; made by Co. Services, galv. i.; paid for by consumer. Meters, 88; owned, controlled and repaired by Co. Use of meters optional with Co.; com-

pulsory for livery, hotels, saloons and power purposes. Hydrants, public, 50; private, 25. CONSUMPTION, unknown. PRESSURE.—Ordinary and fire, 65 lbs. One steam fire engine is used. FINANCIAL.—Cost, $125,000. Cap. Stock authorized, $150,000; paid-up, $100,000. No preferred stock nor debt. Revenue (in '90), $7,749: Consumers, $7,204; City, $545. MANAGEMENT.—Prest., Isaac W. Brooks; Secy. and Treas., Chas. L. McNeil; Supt., O. R. Fyler. Rept. by Secy., June 10. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Apr. 1, '82.

50. **UNIONVILLE**, Hartford Co. (Not given.) Built in '94 by Unionville Water Co., put in operation Oct., '94. Engrs. and Contrs., Conn. Pipe Mfg. Co., New Haven. FRANCHISE.—Co. not exempt from local taxes. City to pay $20 per hydrant per yr. No legal difficulties. SUPPLY.—Trout Brook, fed by spring. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by income. Taps, made by Co. Services, iron; paid for by owner of property. Meters, 0. Use of meters optional with consumer. Hydrants, public, 32; private, 8. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $29,000. Cap. Stock: Pref'd, authorized, $28,000. Expenses: Operating, $250; taxes, $48. MANAGEMENT.—Prest., Saml. Frisbie; Secy., Geo. E. Taft; Treas., W. A. Hitchcock; Supt., T. Chamberlain. SEWERS.—Has storm sewers.

51. **WALLINGFORD**, New Haven Co. (4,280.) Built in '82 by borough. SUPPLY.—Lake Pistapaugh, by gravity. Area, 136 acres; drainage area, ½ sq. mile; drainage from additional ¾ sq. mile can be diverted into lake. Supply main, old, 12-in. c. i., reduced to 10 and 8-in.; new (rept. in '91 as under contract), 16, 14 and 12-in., partly w. i. and cem., partly c. i. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—(In '90.) Mains, 18 miles. Taps, 682. Services, galv. i. Meters, 0. Hydrants, 70. PRESSURE.—Ordinary, 100 to 130 lbs. FINANCIAL.—(In '90.) Cost, $111,659. Bonded debt, $105,000. Expenses, $5,721: Int., $4,220. Revenue, $7,749. MANAGEMENT.—Three Comrs. SEWERS.—Has sewers. REFERENCES.—Eng. News, Dec. 23, '82; Jan. 20, '83.

48. **WAREHOUSE POINT**, Hartford Co. Supply from Thompsonville.

52. **WATERBURY**, New Haven Co. (28,646.) Built in '68 by city. Additional supply introduced in '94 and put in operation Jan. 17, '95; Engr., Robt. A. Cairns. SUPPLY.—East Mountain Brook and West Branch of the Naugatuck River, by gravity. New Supply main, about 10 miles 36-in. c. i. PUMPS.—Cap., 1,000,000 galls.; Worthington non-comp. high pressure, for emergency. RESERVOIRS.—Cap., 535,000,000 galls. Storage: East Mountain Brook, 100,000,000, with area about 35 acres. Prospect, 67,000,000. West Branch, 350,000,000. Distributing: East Mountain Brook, 8,000,000, 225 ft. above town. Cooke St., 10,000,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 38 miles; cost extensions met by appropriation. Taps, 4,023; made by city, free. Services, galv. i.; paid for by property owner. Meters: 270; owned, controlled and repaired by city; yearly rental, 10% of cost. Use of meters compulsory for mills, stables, bakeries, etc. City can compel use of meters and any consumer may have one. Hydrants, public, 230; private, 50. CONSUMPTION.—(Galls.) av., 4,000,000. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Total cost, $1,283,000. Old plant, $583,000; New supply, $700,000. Bonded debt, $150,000, at 7%, due '97; $40,000, at 7%, due '99; $50,000, at 4½%, due $5,000 each year from '96 to 1905; $500,000, at 4%. Sinking Fund: $122,850, invested in savings banks, city bonds, etc., at 4, 4½, 5 and 7%. Expenses, $68,495: Operating, $24,607; int., $43,775; taxes, $113. Revenue, $88,876: Consumers, unmetered, $53,857; metered, $30,289; City, fire protection, $4,530; street sprinkling, $200. MANAGEMENT.—Board of Public Works; Chn., E. G. Kilduff, Mayor; Supt., P. W. Halpin. Rept. by R. A. Cairns, City Engr., June 29. SEWERS.—Has sanitary and partial system of storm sewers. REFERENCES.—Eng. News, Aug. 20, '81. Reservoirs, Jan. 18, '94. Use of state survey in planning, May 9, '95.

53. **WEST HAVEN**, New Haven Co. (Not given.) Built in '83 by West Haven Water Co. SUPPLY.—Springs, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; Worthington simple high pressure. Bituminous coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., 750,000 galls.; distributing. DISTRIBUTION.—Mains (in '90), 12½ miles. Taps, 700; made by Co. Services, galv. i.; paid for by consumer. Meters: 6; owned by consumer; controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 30; private, 2. CONSUMPTION.—(Galls.) av., 400,000; max., 600,000; min., 300,000. PRESSURE.—Ordinary, 25 lbs.; fire, 40 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock (in '90), $100,000. Expenses: Operating, $4,000. MANAGEMENT.—Prest., D. Goffe Phipps; Secy. and Treas., James Foy; Ch. Pump. Engr., position vacant. Rept. by Supt., C. A. Thompson, in June. SEWERS.—None. REFERENCE.—Cove River dam, Eng. News, June 21, '90.

54. **WESTPORT**, Fairfield Co. (3,715.) Built in '92 by Westport Water & Electric Light Co.; put in operation in Nov. Engr., M. J. Daly, Waterbury. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 1,200,000 galls.; Blake. Bituminous coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., not given. DISTRIBUTION.—Mains, 10 miles. Taps, 250; made by Co. Services, iron; paid for by consumer. Meters, 20; owned by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50; private, 2. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 60 lbs.; fire, same. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Wm. L. Coley;

Vice-Prest., Wm. H. Childs; Secy., John S. Jones; Treas., Francis W. Marsh, Bridgeport; Auditors, Wm. H. Childs and Chas. Fable; Supt., Fred B. Hubbell. Rept. by Supt., June 18. SEWERS.—Has partial storm sewers only.

55. **WILLIMANTIC**, Windham Co. (8,648.) Built in '85-6 by city. SUPPLY.—River Natchaug, pumping to reservoir. PUMPS.—Cap., 2,500,000 galls. Water power and steam, both used; 2,000,000 Barr under construction. Bituminous coal used; av. cost, $4.45 per short ton. RESERVOIRS.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 21 miles; cost extensions met by appropriations. Taps, 900; made by city. Services, lead; paid for by city. Meters, 400; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, 175. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost (in '88), $239,440. Bonded debt (in '90), $200,000. (Balance of financial information is for yr. ending Nov., '94.) Expenses, $13,200; int., $8,200. Revenue, $13,445: Consumers, $10,945; City, $2,500. MANAGEMENT.—Prest., W. D. Bridgham; Secy. and Treas., Samuel Miller; Supt., H. S. Moulton. Rept. by Supt., June 13. SEWERS.—Has sanitary and storm sewers.

56. **WINDSOR**, Hartford Co. (2,954.) Built in '69-70 by N. Sidney Hayden; known as Windsor Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 8,000,000 galls. Supply main (in '89), 600 ft. of 8-in., one mile of 6-in. DISTRIBUTION.—(In '90.) Mains, 2 miles. Taps (in '88), 30. Meters, 0. Hydrants, 7. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 25 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $40,000. No debt. Revenue, $1,200. MANAGEMENT.—Owner, H. S. Hayden. SEWERS.—Has sewers.

57. **WINDSOR LOCKS**, Hartford Co. (2,758.) Built in '89 by Windsor Locks Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 13,000,000 galls.; 1,000,000 Deane comp. dup. steam and 300,000 Knowles water power. STAND-PIPE.—Cap., 235,000 galls; 20 × 100 ft. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 125. Services, iron. Meters, 2. Hydrants, 48. PRESSURE.—Fire, 80 lbs. FINANCIAL.—Cost, $66,000. Cap. Stock: Authorized, $80,000. Bonded debt, $50,000, at 5%. MANAGEMENT.—Prest., Ed. D. Coogan; Secy., S. B. Douglas; Treas. and Gen. Mgr., Geo. M. Montgomery. Rept. by Gen'l. Mgr.

58. **WINSTED**, Litchfield Co. (4,846.) Built in '62 by borough; extensive improvements made in '93-5. SUPPLY.—Crystal Lake and Mad River, by gravity. Manufacturers and summer residents in vicinity of Wakefield Boulevard supplied from Highland Lake. Crystal Lake about 1 × 3 miles. In '92-4 supply was supplemented by building dam across Mad River and diverting water through a canal to a new reservoir, from which a 6 × 6-ft. rock cut tunnel some 3,500 ft. long leads to the reservoir. New supply main from reservoir was also laid. RESERVOIR.—Cap., 398,574,000 galls.; impounding. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 15½ miles; cost extensions met by income and taxation. Taps, not given; made by consumer. Services, lead; paid for by borough to curb. Meters, 3. "Just begun to use them." Hydrants, public, 137; private, 9. PRESSURE.—Ordinary, 70 to 157 lbs. One steam fire engine is used. FINANCIAL.—Cost, $314,257. Bonded debt, $100,000, payable $2,500 yearly for 10 years; $3,500 yearly second 10 years; $4,000 yearly third 10 years. Revenue, $7,636. MANAGEMENT.—Water Comrs., G. L. Andrews, M. Ryan, H. P. Wetmore; Borough Treas., H. W. Robinson. Rept. by G. L. Andrews, July 16. SEWERS.—None. REFERENCE.—Eng. News, Dec. 17, '81.

59. **WOODBURY**, Litchfield Co. (1,815.) Built in '94 by Woodbury Water Co. Engr., M. L. Beardsley, Roxbury. Contr., A. R. Boardman, Naugatuck. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City does not pay for public service. No legal difficulties. SUPPLY.—Brooks and springs collected in an impounding reservoir. RESERVOIRS.—Cap., 800,000 galls. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 44; made by consumer. Services, wrought iron; paid for by consumer. Meters, 0. Hydrants, 16. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 55 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $15,536. Cap. Stock: Authorized, $15,000; all paid-up; paid 2% div'd. Floating debt, $536, at 6%. Sinking Fund: $536, invested in floating debt, at 6%. Expenses: Operating, $179; taxes, $10. Revenue: Consumers, $646. MANAGEMENT.—Prest., H. D. Curtiss; Secy. and Treas., A. W. Mitchell, North Woodbury. Rept. by Secy., June 8. SEWERS.—None.

GROUP II.—MIDDLE STATES.

Water-Works Completed, in Process of Construction or Projected, in New York, New Jersey, Pennsylvania, Delaware, Maryland and District of Columbia.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

NEW YORK.

1. **ADAMS,** Jefferson Co. (1,360.) Built in '86 by Adams Water-Works Co. SUPPLY.—Springs, pumping to stand-pipe, with direct pumping in case of fire. PUMPS.—Cap., 1,000,000 galls.; Worthington simple high pressure. STAND-PIPE.—Cap., 55,000 galls.; iron, 15 × 40 ft. DISTRIBUTION.—Mains, 3½ miles. Taps, 79. Services, galv. i. Meters, 3. Hydrants, 25. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—Ordinary, 44 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $30,000. Debt, $25,000, at 6%. Expenses: Operating, $1,000. Revenue, $3,282: Consumers, $2,100; City, $1,182. NOTE.—No rept. since '89-90 Manual. Press rept., Nov. 25, '96, stated application for receiver had been made by first mortgage bondholders and that an injunction had been served on Vil. Prest. restraining "payment of the water tax." Another press rept. states that Jan. 1, '97, Co. filed statement with County Clk., as required by law, showing $25,000 paid-up cap. stock, and $45,280 debt; statement signed by F. B. Roblins, V.-P.; Frederick Seymour, Secy., and E. Lewis, Trustee.

2. **ADDISON,** Steuben Co. (2,166.) Built in '89 by Addison Water Co. FRANCHISE.—10 yrs. from '95; provides that town may purchase works at end of any five years. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxation. City to pay $20 per hydrant per yr. for first 50; $25 each for 12 hydrants. SUPPLY.—Spring, stream and well, pumping to reservoir. Pumping used only as auxiliary. PUMPS.—Cap., 750,000 galls.; Worthington comp. cond. Shavings and mill refuse used as fuel. RESERVOIRS.—Cap., 2,000,000 to 3,000,000 galls.; on stream. FISCAL YEAR CLOSED Jan. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by treasury bonds. Taps, 150; made by Co., free. Services, galv. i.; paid for by property owner. Meters: 6; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, 62. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $50,028. Cap. Stock: Authorized, $10,000; all paid-up. Bonded debt, $40,000, at 6%, due 1909. Revenue: City, fire protection, $1,300. MANAGEMENT.—Prest., C. W. Knight, Rome; Secy. and Treas., Chas. C. Hopkins, Rome; Supt., J. A. Hoffman. Rept. by Secy., Aug. 14. SEWERS.—None. REFERENCE.—Wells, Eng. News, Mar. 14, '95, illus.

3. **AFTON,** Chenango Co. (683.) Built in '95 by village. Engr., J. Warren Lamb, Cooperstown. Contrs., Munson & Lewis, Herkimer. SUPPLY.—Two springs (400,000 galls.; cap. per day, "in driest weather"), by gravity, through reservoir. RESERVOR.—Cap., 130,000 galls.; masonry, covered. DISTRIBUTION.—Mains, 8 miles. Taps, 100; made by consumer. Services, lead; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, 34. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 84 lbs. FINANCIAL.—Cost, $22,000. Bonded debt, $22,000, at 4%, due in 1915. MANAGEMENT.—Water Comrs.; Prest., E. W. Kirstead; Secy., E. W. Singer; Treas., M. J. Mudy, Jr. Rept. by Treas., June 12.

4. **AKRON,** Erie Co. (Est., 1,492.) Under construction in '96 by city. Engr., J. F. Witmer, Buffalo, Contr., W. B. Wilson. SUPPLY.—Springs. PUMPS.—Cap., 1,500,000 galls.; Snow comp. steam and Deming power, 750,000 each. RESERVOIR.—Cap.,

48,750 galls. STAND-PIPE.—Cap., about 100,000 galls.; steel, 15 × 75 ft. DISTRIBUTION.—Mains, 5¼ miles. Taps, made by village. Services, paid for by consumer. Meters, 0. Hydrants, 52. PRESSURE.—Ordinary, 105 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $29,000, at 4%, due Apr. 1, 1926. MANAGEMENT.—Prest., H. L. Neuman; Secy., H. H. Newton; Treas., R. S. Tabor; Ch. Pump. Engr., Herman Lewis. Rept. by Secy., June 10. SEWERS.—None.

5. **ALBANY,** Albany Co. (94,923.) First supplied from small gravity works built by Co. in 1798 or 1799; bought by city in '51 and extended. SUPPLY.—Maezlandt Kill and Patroon Creek, by gravity; Hudson River by pumping. Drainage area, not including river, 12.46 sq. miles. PUMPS.—Cap., 46,250,000 galls.; one Worthington high pressure, 1,250,000 and two beam condensing engines, 5,000,000 each, all pumping from Bleecker reservoir; two beam condensing engines, 10,000,000 each and three Allis triple expansion comp. cond. of 5,000,000 each, all pumping from Hudson River. Anthracite coal used; av. cost, $3.21 per short ton. RESERVOIRS.—Cap., 227,120,000 galls. Storage: Renssalaer Lake, 125,700,000; area, 44.6 acres; drainage area, 3.82 sq. miles; available depth, 15.4 ft.; 262 ft. above tide. Russell Road and Russell Road Pond, 16,300,000 and 11,700,000, area 4 and 5 acres; drainage area, 4.51 sq. miles; available depth, 14.5 and 11.75 ft.; elev., each 195 ft. above tide. Sand Creek Ponds (3), 16,850,000 galls.; area, 9.4 acres; drainage area, 3.38 sq. miles; available depths, 10, 8.33 and 9.33 ft.; elev. above tide, 213 ft. Distributing: Bleecker, 30,000,000 galls.; 242½ ft. above tide. Prospect Hill, 7,500,000; 297½ ft. above tide. Tivoli, 19,000,000; 176¾ ft. above tide. Maezlandt Kill, 70,000; reservoir is filled by gravity from Renssalaer reservoir, and by pumping from Hudson River; Prospect Hill is filled by pumping from Hudson River or Bleecker reservoir; Tivoli is filled by gravity from Russell Road and Sand Creek. Prospect Hill supplies upper service, Renssalaer Lake and Bleecker reservoir supplies middle service and balance supply low service. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 123 miles; cost extensions met by bond issue or from maintenance fund. Taps, 16,600; made by city for $3 to $5. Services, lead; paid for by property owner. Meters, 1,180; owned, controlled and repaired by city. Use of meters optional with city; not compulsory for private dwellings. Hydrants, 752. CONSUMPTION.—(Galls.) av., 18,000,000. PRESSURE.—Ordinary, 40 to 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,020,000. Bonded debt, $1,069,500; $389,000, at 7%; $300,000, at 6%; $755,500, at 4%; $165,000, at 3%. Sinking Fund: $57,000, invested at 3%. Expenses: Operating, $117,580. In '95, city paid $159,673 of int. and bonds. Revenue, $294,003. Deficits.—May be met by issue of bonds where revenue of department is insufficient. MANAGEMENT.—Prest., William H. Weaver; Secy. and Supt., George I. Bailey; Ch. Pump. Engr., John J. Greagan. Rept. by Supt., June 13. PROJECTED IMPROVEMENTS.—Investigations for filtering system now in progress. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, June 4, '81; cost of supply from Kinderhook Creek, Jan. 26, '93.

6. **ALBION,** Orleans Co. (4,586.) Built in '88-9 by Albion Water Works Co. FRANCHISE.—Allows purchase of works by city in '99, price to be determined by appraisers, but not to be less than cost. Rates are fixed in franchise. SUPPLY.—Wells, pumping to stand-pipe. Wells (in '89), 30 to 100 ft. deep. PUMPS.—Cap., 1,700,000 galls.; two Volker & Felthousen comp. dup. STAND-PIPE.—Cap., 250,000 galls.; steel, 75 ft. high on masonry foundation. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 8½ miles. Taps, 400. Meters, 190. Hydrants, 80. PRESSURE.—Ordinary, 75 to 85 lbs. FINANCIAL.—Cap. Stock, authorized, $100,000; all paid-up. Bonded debt, $100,000, at 6%. Revenue: City, $3,000. NOTE.—No rept. since '90-1 Manual.

7. **ALTAMONT,** Albany Co. (Not given.) Built in '92-3 by village. Engr., Wm. B. Rider, South Norwalk, Conn. Contrs., Ayrault Bros. & Co., Tonawanda. SUPPLY.—Impounding reservoir fed by springs, by gravity. RESERVOIRS.—Cap., 16,200,000 galls. Storage, 16,000,000; distributing, 200,000. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by income. Taps, 60. Services, lead and iron; paid for by consumer. Meters, 1. Use of meters optional with Co.; compulsory for R. R. Co. Hydrants, 18. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 50-80 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $15,800: $13,580, at 3½%; due 1907; $2,300, at 5%; due 1902. Expenses, $1,672. Revenue, $1,816. MANAGEMENT.—Prest. of Village, M. A. Sand; Secy., Joseph Snyder; Treas., H. A. Wilber. Rept. by Prest., June 10. SEWERS.—None.

8. **AMENIA,** Dutchess Co. (2,362, town.) Built in '91 by Amenia Water Co. Engr. and Contr., John R. Thompson. SUPPLY.—Gravity. PUMPS.—Cap., 750,000 galls.; Worthington simple high pressure. RESERVOIR.—Storage. TANK.—Cap., 81,000 galls.; wood; for fire reserve; 24 × 24 ft. DISTRIBUTION.—Mains, 1½ miles. Taps, 60; made by Co., free. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters: Co. can compel use of meters and a consumer may have one. Hydrants, 14. PRESSURE. Ordinary, 110 lbs.; fire, 70 lbs. FINANCIAL.—Cost, withheld. Cap. Stock: Authorized, $10,000; all paid-up. No debt. Expenses: Operating, $80. Revenue, $1,150: Consumers, $900; City, fire protection, $250. MANAGEMENT.—Prest., B. H. Fry; Secy. and Treas., C. Walsh; Supt., J. R. Thompson. Rept. by Supt., June 11. SEWERS.—None.

9. **AMITYVILLE,** Suffolk Co. (2,293.) Built in '94, or earlier, by Amityville Water Co. FRANCHISE.—City to pay $25 per hydrant per yr. for 40 hydrants; 5-yr.

contract. SUPPLY.—Surface water, pumping to stand-pipe. NOTE.—No official rept. could be obtained. Above from press repts.

10. **AMSTERDAM,** Montgomery Co. (17,366.) Built in '82 by city. SUPPLY.—McQueen and Rodgers Creeks, five miles distant, Hans Creek, 21 miles distant, by gravity, and Little Round Lake in very dry season. RESERVOIRS.—Rodgers and McQueen, 80,800,000 galls.; Hans Creek, not given; Little Round Lake, 150,000,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 25 miles, 15 miles of this distance being supply conduit; cost extensions met by income. Taps, 2,078; made by city, free. Services, lead; paid for by owner. Meters: 80; owned and repaired by city. Use of meters optional with city; compulsory for mills, stores and motors. Hydrants, 261. CONSUMPTION.—(Galls.) av., 5,000; max., 7,000; min., 3,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $497,061. Bonded debt, $383,000, at 3 and 5%: $14,000 due '96, $14,000 due 1901, $42,000 due 1906, $49,000 due 1911, $59,000 due 1916 and $65,000 due 1921, all at 5%; and $115,000 due 1910 and $25,000 due 1926, both at 3%. Expenses, $21,002: Operating, $4,648; int., $16,354. Revenue, $35,647: Consumers, unmetered, $28,325; metered, $7,272; City, fire protection, none; street sprinkling, $50; sewer flushing, none; public buildings, none. No deficits. MANAGEMENT.—Prest., John Kellogg; Secy., John I. Christman; Treas., James Voorhees; Supt., James R. Snell. Rept. by Supt., June 11. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 4, '83; use of vitrified pipe, April 28, '88.

11. **ANDES,** Delaware Co. (416.) Built in '76 by Andes Water Co. FRANCHISE.—Does not provide for purchase of works by village. Rates are not fixed in franchise nor subject to regulation by village. Co. is exempt from local taxes. Village furnished hydrants in consideration of the privilege of using water for fire purposes, only. SUPPLY.—Springs, by gravity from reservoir. RESERVOIR.—Cap., 149,600 galls. Distributing, ¼ mile from village. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 1 mile. Taps, 82; made by consumer. Services, lead or iron; paid for by consumer. Meters, 0. Hydrants, 16. CONSUMPTION, unknown. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $7,200. Cap. Stock: Authorized, $6,000; all paid-up; paid 8½% div'd. No debt. Expenses, $325: Operating, $250; taxes, $75. MANAGEMENT.—Prest., James F. Scott; Secy., Treas. and Supt., David Ballantine. Rept. by Supt., June 17. SEWERS.—None. REFERENCE.—Eng. News, Apr. 29, '82.

12. **ANDOVER,** Allegany Co. (1,766, town.) Built in '93 by city. Engr., E. D. Smalley, Syracuse. Contr., M. B. Birdseye, Fayetteville. SUPPLY.—Spring, by gravity. Springs are covered and are 302 ft. above main street. RESERVOIR.—Storage, 160 ft. above main street and on opposite side of village from springs. FISCAL YEAR CLOSED Sept. 1, '95. DISTRIBUTION.—Mains, 5 miles. Taps, with service to curb line, cost consumer, $7.50. Services, iron. Meters, 0. Hydrants, 32. CONSUMPTION.—(Galls.) av., 8,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 5%, due Sept. 1, '98. Expenses: Int., $1,000. Revenue: Consumers, $900. Deficits are met by taxation. MANAGEMENT.—Prest., P. C. Lynch; Secy., H. A. Benedict; Treas., E. J. Atwood. Rept. by Secy., June 27. SEWERS.—None.

13. **ANGELICA,** Allegany Co. (953.) Built in '96 by village; put in operation Sept. Engr., J. F. Witmer, Buffalo. Contr., M. B. Birdseye, Syracuse. SUPPLY.—By gravity from a spring of 170,000 galls. dy. cap.; 5 miles from, and 147 ft. above village. RESERVOIR.—Cap., 500,000 galls.; concrete lined, and placed on a 140 ft. elevation within 1,500 ft. of village, for emergency demands. DISTRIBUTION.—Mains, 8½ miles. Services, galv. iron; paid for by consumer. Meters, 0. Hydrants, 37. PRESSURE.—Ordinary, 62 lbs. FINANCIAL.—Est. Cost, $27,000. Bonded debt, $27,000, at 3½%, due $1,000, each year after 1899. MANAGEMENT.—Chn., M. S. Blair; Secy., A. K. Fletcher; Treas., Wm. Weaver. Rept. by J. H. Rutherford, Sept. 28. SEWERS.—None.

14. **ANTWERP,** Jefferson Co. (912). Built in '95 by village. Engr., F. A. Hinds, Watertown. Contrs., Ferris & Knapp, Watertown. SUPPLY.—Indian River, pumping to stand-pipe. PUMPS.—Cap., 860,000 galls.; Worthington vert. trip. water power. STAND-PIPE.—Cap., 117,500 galls.; 20 × 50 ft., built by Tippett & Wood, Phillipsburg, N. J. DISTRIBUTION.—Hydrants, 45. FINANCIAL.—Cost (contract price), $17,292. Bonded debt, $19,000, at 4%. MANAGEMENT.—Comrs. NOTE.—No official rept. could be secured. Above mostly from press repts.

D 1, P 1. **ARCADE,** Wyoming Co. (1,840, town.) Built in '93 by Arcade Planing Mill Co. for fire protection and street sprinkling only. Franchise, three years from '93. No compensation for public service. Supply, Clear Creek. Pump, Rumsey rotary, 432,000 galls. daily. Water power or steam used. Mains, 3,000 ft. of 3-in. Hydrants, 15. Pressure, 150 lbs. No sewers. Rept. by F. S. Wormer, Mgr., Nov. 13.

Gravity works projected by Cattaraugus & Wyoming Water Supply Co., to supply Sandusky, Arcade and Yorkshire. Supply, springs, by gravity. Cap. stock, $40,000. Secy., P. N. Cowan, Arcade. Officers (Feb. 26, '96): Prest., J. H. Shallies; Secy., Burt B. Lewis.

P 2 **ARDEN,** Orange Co. (Not given.) Arden Water Co. was incorp. June 17, '96. Directors: E. H. Harriman, Arden; F. A. Leary, Southfield; Chas. D. Simons, 49 Exchange Place, N. Y. city. (Press rept.)

15. **ARDSLEY,** Westchester Co. (Est., 220.) Built in '96 by Ardsley Heights Water Co. Contr., Geo. Eldridge, Sing Sing. SUPPLY.—Driven wells, pumping to tanks. PUMPS.—Cap., 144,000 galls.; Snow. Coal used; av. cost, $5.50 per short ton. TANKS.—Two, cap., 24,000 galls., on masonry foundation. DISTRIBUTION.—Mains, 2½ miles. Taps, 25; made by Co. for $5. Services, iron; paid for by owners. Meters, 25; owned and repaired by consumer; controlled by Co. Use of meters compulsory for all services. Hydrants, 12. CONSUMPTION.—(Galls.) av., 3,000. PRESSURE.—Ordinary, 140 lbs. FINANCIAL.—Cost, $10,900. Expenses: Operating, $360. Revenue: City, fire protection, $240. MANAGEMENT.—Prest., W. E. Reynolds, Croton Lake. Rept. by Supt., F. B. Reynolds.

16. **ARENA,** Delaware Co. (Est., 229.) Built by Arena Water Co. (date not given, but probably within 2 or 3 yrs.). Engr., W. H. Cowan, Stamford, N. Y. SUPPLY.—Spring, by gravity from reservoir. Fire hydrants are used and drinking water furnished. MANAGEMENT.—Supt., F. H. McLean.

103. **ARVERNE-BY-THE-SEA,** Queens Co. See Far Rockaway.

17. **ATTICA,** Wyoming Co. (1,994.) Purchased in '96 by Maplewood Water-Works Co. (Press rept.) Built in '79-80 by Attica Water Supply Co. FRANCHISE.—Provides for purchase of works by city according to general State law. Rates to be approved by trustees. SUPPLY.—Spring, by gravity. RESERVOIRS.—Crow Creek reservoir, 12,000,000; also new reservoir, built in '95 by Maplewood Water-Works Co. DISTRIBUTION.—Mains, 7½ miles. Taps, 150. Services, w. i. Meters, 1. Hydrants, 32. PRESSURE.—Ordinary, 62 lbs. FINANCIAL.—Cap. Stock, $60,000. Debt, $45,000: Floating, $5,500, at 6%; Bonded, $40,000, at 6%. Revenue: City, $1,120. PROJECTED IMPROVEMENTS.—Filtering plant (press rept.), to cost $5,000; contract let in fall of '96. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 21, '82.

18. **AUBURN,** Cayuga Co. (25,858.) Purchased in '94 by city for $425,000; built in '65 by Auburn Water Works Co. SUPPLY.—Owasco Lake, pumping direct. Lake about 1 × 12 miles; drainage area, excluding lake, 144 sq. miles. Siphon of 24 and 30-in. pipe, 9,350 long, extends from lake to main pumping station; air pipe one mile long, connected at several points on pipe and with air pump. One of the 7,500,000 pumps is at lake, for emergency use, but for one period of 3½ yrs., or more, had not been used at all. PUMPS.—Cap., 19,000,000 galls.; 2—7,500,000 hor. Holly-Gaskill, one being a high duty, built to operate by either steam or water power; one 4,000,000 Holly quadruplex. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 38 miles; cost extensions met by earnings; $14,000 put aside each year. Taps, made by city. Services, iron; paid for by consumer. Meters, 400; owned, controlled and repaired by city. Use of meters optional with city; compulsory for manufacturers. Hydrants, public, 350; private, 100. CONSUMPTION.—(Galls.) av., 3,500,000; max, 4,000,000; min., 3,000,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $443,643. Bonded debt, $393,000. Sinking Fund, $13,000 per year. Expenses, $32,200: Operating, $16,000; int., $16,200. Revenue, $58,900: Consumers, unmetered, $28,000; metered, $19,000; City, fire protecton, $11,600; street sprinkling, $300. MANAGEMENT.—Prest., C. Wheeler, Jr., Supt., J. Lewis Grant. Ch. Pump. Engr., John Ackerman. REFERENCES.—Eng. News, Oct. 15, '81; siphon, Nov. 1, '90.

19. **AVOCA,** Steuben Co. (953.) Built in '89 by village. SUPPLY.—Springs and creek, by gravity from reservoir. Springs, 140 ft. above, 1½ miles from village. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by taxation. Taps, 187; made by village, free. Services, iron; paid for by consumer. Meters, 0. Use of meters: Village can compel use of meters and any consumer may have one. Hydrants, public, 36; private, 3. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $20,000. Debt, $18,700: Floating debt, $700, at 6%; Bonded, $18,000, at 3½%, due 1909. Expenses, $680: Operating, $50; int., $630. Revenue: Consumers, $325. Deficits, met by taxation. MANAGEMENT.—Prest., Jas. L. Hunn; Secy. and Supt., A. J. Arnold; Treas., J. W. Griswold; Clk., E. W. Bozard. Rept. by Clerk, Sept. 7. SEWERS.—None.

20, 21. **AVON,** Livingston Co. (1,653.)

STEPHEN HOSMER'S WORKS.

Built in '57. Supply, by gravity. 7 miles of mains, 200 taps and 9 hydrants.

VILLAGE WORKS.

Built in '88. SUPPLY.—Conesus Lake, by gravity to distributing reservoir. Intake, w. i., 1,300 ft. long, ending in 16 ft. water. Supply main, about 7 miles, of which 1½ miles (in '89), is vitrified pipe and balance Wyckoff wood pipe. FILTER.—Midway between reservoir water under pressure passes through coke confined in w. i., tank; current may be reversed for washing. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 14 miles. Hydrants, 32. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 115 lbs. FINANCIAL.—Cost, $65,000. Bonded debt, $50,000, at 3.7%. MANAGEMENT.—Secy., W. H. Farnum; Supt., Homer Sackett. Rept. by Secy., Oct. 2. SEWERS. None. REFERENCE.—Eng. News, Dec. 24, '81.

22. **BABYLON,** Suffolk Co. (6,035, town.) Built in '93 by Sumpwams Water-Works Co.; put in operation Aug. 1. Engr. and Contr., Oscar Darling. FRANCHISE.—50 yrs. from '92. SUPPLY.—Driven wells, F. W. Miller's patent, by pumping. PUMPS.—Cap., 900,000 galls.; 2—450,000 Worthington non-cond.; one comp. and one non-comp. Anthracite egg coal used; av. cost, $5 per short ton. TANKS.—Cap., 14,000 galls.; Two multiple compression tanks, 7,000 galls. each, patented by W. E. Worthen, N. Y. city, and Oscar Darling, Babylon. DISTRIBUTION.—Mains, 7 miles. Taps, 120; made by Co. for $8.50. Services, galv. i.; paid for by consumer. Hydrants, 33. CONSUMPTION.—(Galls.) av., 200,000; max., 250,000; min., 150,000. PRESSURE.—Ordinary, 50 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $43,750. Cap. Stock: Authorized, $40,000; paid-up, $37,000; no div'd last fiscal year. Floating debt, $5,700, at 6%. Expenses: Operating, $2,500; int., $342. Revenue, $4,990: Consumers, unmetered, $3,800; City, fire protection, $990; street sprinkling, $200. MANAGEMENT.—Prest., W. F. Norton; Secy., Jeremiah Robbins; Treas., Dr. A. J. Woodruff; Supt., B. B. Wood. Rept. by Supt., Nov. 12. SEWERS.—None.

23. **BAINBRIDGE,** Chenango Co. (1,049.) Now owned by the Bainbridge Water-Works Co.; built in '83 by J. M. Roberts. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Artesian wells, springs and reservoirs, by gravity. RESERVOIRS.—Two, one having area of 15 acres; one 50× 120 ft., 16 ft. deep. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles. Taps, 60. Services, lead and w. i. Meters, 0. Hydrants, 22. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $20,000. Bonded debt., $15,000. Expenses: Operating, $300. MANAGEMENT.—Prest., D. A. Gilbert; Secy., Treas. & Supt., J. M. Roberts. Rept. by Supt., July 14. SEWERS.—None. REFERENCE.—Eng. News, Jan. 3, '85.

24. **BALDWINSVILLE,** Onondaga Co. (3,040.) Built in '89-90 by village; put in operation Jan. 7, '90. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Well, pumping to stand-pipe. Well 20× 20 ft., lined with boiler iron. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon dup. comp. cond. Bituminous coal used; av. cost, $3.25 per short ton. STAND-PIPE.—Cap., 217,000 galls.; iron, 20 × 50 ft.; top, 200 ft. above principal street. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by taxation. Taps, 518; made by village to curb for $5. Services, galv. i.; paid for by property owners. Meters: 22; owned, controlled and repaired by village. Use of meters optional with city; compulsory for public places. Hydrants, public, 76; private, 5. CONSUMPTION.—(Galls.) av., 160,000. PRESSURE.—Ordinary, 76 lbs.; fire, 86 lbs. FINANCIAL.—Cost, $65,000. Bonded debt, $60,000, at 3½%; due, $50,000 in 1909, $10,000 in 1910. Expenses, $7,607: Operating, $4,318; int., $2,100; taxes, $1,189. Revenue: Consumers, metered, $609; City, fire protection, $1,189. Deficits are met by taxation. MANAGEMENT.—Prest., C. N. Bliss; Secy., G. G. Mercer; Treas., J. E. Connell; Supt., Wm. Rodger; Ch. Pump. Engr., Wm. King. Rept. by Supt., Aug. 11. SEWERS.—Partial system of sanitary sewers.

25. **BALLSTON SPA,** Saratoga Co. (3,527.) Built in '70 by village. SUPPLY.—Springs, by gravity. Present supply is inadequate. RESERVOIRS.—Two storage. DISTRIBUTION.—Mains, 12 miles. Taps, 600. Services, w. i. and cem. Meters, 1. Hydrants, 100. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary (in '89), 36 lbs. FINANCIAL.—Cost, $100,000. Bonded debt, $70,000, at 5 and 7%. Expenses: Operating, $500. Revenue: Consumers, $8,100. MANAGEMENT.—Prest., Thos. Finley; Village Clk., W. L. Grase; Treas., Chas. A. Taylor. Rept. by Village Clk., Oct. 19. SEWERS.—Partially sewered. REFERENCE.—Eng. News, Sept. 29, '83.

D 2 ? **BANGOR,** Franklin Co. (2,445.) Press rept., Aug. 22, '95, stated Bangor Water Co. had been incorp. with cap. stock of $2,500 by N. W. Lawrence, J. R. Johnson and others. Aug., '96, D. P. Mason rept.: "The works here have been completed."

26. **BATAVIA,** Genesee Co. (7,221.) Built in '65 by village. SUPPLY.—Tonawanda Creek, pumping to tank and direct in case of fire. The system is connected with the Johnston Harvester Co.'s water plant, which has a pumping cap. of about 2,000,000 galls. and a storage reservoir of 100,000 galls, and also with the shoe factory pump, which has a capacity of 500,000 galls. and pumps direct from creek. PUMPS.—Cap., 4,000,000 galls.; Holly-Gaskill; not stated whether in addition to above. TANK.—Cap., 22,000 galls.; wooden, 40 ft. high, on stone foundation. DISTRIBUTION.—Hydrants, 100. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $175,000. Bonded debt (in '91), $35,000, at 3½%. Expenses: Operating (in '90), $3,500; bonds and int., $5,225. Revenue: Consumers, unmetered, $3,000. MANAGEMENT.—Water Comrs. NOTE.—No rept. since '90 Manual. SEWERS.—Has sewers. REFERENCE.—Eng. News, Feb. 4, '82.

27. **BATH,** Steuben Co. (3,261.) Built in '87 by Bath Water-Works Co. SUPPLY.—Wells and springs, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Blake. STAND-PIPE.—Cap., 305,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 7 miles. Taps, 180. Meters, 51. Hydrants, 73. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 80 lbs.; fire, 124 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $100,000; all paid-up; paid no div'd in '90. Bonded debt, $60,000, at 6%. Revenue: City, $2,482. NOTE.—No rept. since '90-1 Manual.

87. **BATH BEACH,** Kings Co. See Brooklyn.

182. **BATH-ON-THE-HUDSON,** Rensselaer Co. (2,399.) See Greenbush.

28. **BAYPORT,** Suffolk Co. See Bay Shore.

87. **BAY RIDGE,** Kings Co. See Brooklyn.

28. **BAY SHORE AND PATCHOGUE,** Suffolk Co. (Islip town, 8,783, including 2,290 in Bay Shore village; Patchogue, est., 4,000.) Now supplied by Great South Bay Water Co.; in '87 Suffolk County Water Co. built works to supply Patchogue and in '89-90 Great South Bay Water Co. built works to supply Bay Shore village and other places in town of Islip. In '94 Cos. consolidated. The several localities supplied are: Bay Port, Bay Shore, Islip, East and West Islip and Sayville, in Islip town, and Bluepoint and Patchogue, in Brookhaven town. Rates of (original) Great South Bay Water Co. not subject to regulation, nor works subject to purchase by town. SUPPLY.—Driven wells, pumping to stand-pipes. PUMPS.—Cap., 2,900,000 galls. Bay Shore: 1,500,000 Knowles. Patchogue: 2—700,000 Holly hor. dup. STAND-PIPES.—Cap. 585,000 galls. Bay Shore, 350,000, 20 × 150, Patchogue, 235,000, 20 × 100 ft. FISCAL YEAR CLOSED in March, '96. DISTRIBUTION.—Co. cannot compel use of meters. Hydrants, public, 251. MANAGEMENT.—Prest., N. T. Sprague; Secy., C. A. Lockwood; Treas., D. A. Boody; Supt., C. G. Sands; Ch. Pump. Engr., Geo. Hofel. Rept. by Supt., Jan. 5, '97. NOTE.—The two companies reported for '90-1 Manual figures under Distribution and Financial aggregating as follows: Mains, 30 miles. Taps, 270. Meters, 29. Hydrants, 224 (see above above for number in '96). Cost, $406,000. Cap. Stock, $160,000, all paid-up. Bonded debt, $240,000; $40,000 at 6%, $200,000 at 5%. Other figures from old repts. omitted as probably being largely est., or approximate. REFERENCES.—Stand-pipe accident, May 24 and June 28, '94, illus., and April 25, '95.

29. **BELMONT,** Allegany Co. (950.) Built in '96 by village; put in operation Oct., '96. Engr., E. Delevan Smalley, Syracuse. Contrs., O'Connor & McKaye, Syracuse. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 360,000 galls. DISTRIBUTION.—Mains, 9 miles. Taps, 40; made by village. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 52. PRESSURE.—Ordinary, 80 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $30,000, at 3½%. MANAGEMENT.—Prest., Elba Reynolds; Secy., H. A. Barney; Treas., W. J. Richardson. Rept. by Prest., Nov. 15. SEWERS.—None.

D 3. **BERLIN,** Rensselaer Co. (Est., 600.) Built in '88 by Berlin Water Supply Co. for domestic use. Supply, springs, by gravity. Reservoir, cap., 1,000,000 galls. Mains, 3 miles. Taps, 20. Meters, 0. Hydrants, 1. Consumption, 75,000 galls. Pressure, 80 to 85 lbs. Cost, $3,000. Cap. Stock, authorized, $5,000; paid-up, $1,000. Debt, floating, $2,000, at 10%. Expenses: Operating, $100. No report since '90-1 Manual.

30. **BINGHAMTON,** Broome Co. (35,005.) Built in '67-8 by city. SUPPLY.—Dug wells and Susquehanna River, pumping direct. PUMPS.—Cap., 18,000,000 galls; 6,000,000 Holly quadruplex; 12,000,000 Holly-Gaskill hor. high duty; a duplicate of latter contracted for in '96. Anthracite buckwheat coal used; av. cost, $2 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 56 miles; cost extensions met by revenue. Taps, 6,000; made by city to curb for $10. Services, galv. i.; paid for by consumer. Meters, 422; owned, controlled and repaired by city. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, 533. CONSUMPTION.—(Galls.) av., 5,217,703. PRESSURE.—Ordinary, 60 lbs.; fire, 85 lbs. Steam fire engines are used. FINANCIAL.—Cost, 600,000. Bonded debt, $14,500, at 7%, due 1900; $153,000, at 3½%, due 1920. Sinking Fund, $85,062, invested at 3%. Expenses: Operating, $20,007; int., $6,475. Revenue, $72,662: Consumers, unmetered, $49,282; metered, $23,185; street sprinkling, $195; no allowance for fire protection, sewer flushing or public buildings. MANAGEMENT.—Prest., D. R. Grant; Secy., John Anderson; Treas., John Bayless; Supt., Darwin Felter; Ch. Pump. Engr., W. H. Ingraham. Rept. by Secy., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 20, '81; submerged pipe-laying, April 13, '93.

31. **BLISS,** Wyoming Co. (Est., 300.) Date built not given. In May, '96, Bliss Water Supply Co. was incorp. to succeed Bliss Water Co. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 45,000 galls. Hydrants, 9. No fire engines used. FINANCIAL.—Cap. Stock: Common, authorized, $9,500; paid-up, $8,700. Revenue: City, fire protection, $180. MANAGEMENT.—Prest., N. L. Walker, Pike; Secy. and Treas., J. T. Symes, Pike; Supt., D. S. Merrill. Rept. by G. S. Van Gorder, Pike.

32. **BLOOMVILLE,** Delaware Co. (Est., 236.) Built in '95 by Co. for general supply. Contr., J. Vaughn, Stamford. SUPPLY.—Springs, by gravity. FINANCIAL.—Cost, about $6,000. MANAGEMENT.—Prest., C. L. Andrus; Secy., F. M. Andrus. Rept. Nov. 13, '96.

28. **BLUEPOINT,** Suffolk Co. (Est., 373.) See Bay Shore.

P 3. **BOLIVAR,** Allegany Co. (2,233, town.) Press rept. July 14, '96, stated J. B. Bradley, E. R. Kilbury and Louis Seibert had been appointed water comrs. and that election would soon be held to vote on building gravity works at cost of $12,000.

P 4. **BOONVILLE,** Oneida Co. (1,613.) People were to vote Dec. 15, '96, on building gravity works. Engrs., Stanwix Engineering Co., Rome, N. Y. Comrs.: Prest., E. B. Austin; Secy., J. P. Babcock; Treas., S. A. Johnson.

P 5. **BRIDGEWATER,** Oneida Co. (1,073.) March, '97, people will vote on building works with supply from springs, pumped to reservoir; est. cost, $9,000. Engr., E. F. Musson, Norwich, N. Y. Doubtful whether vote will be favorable, on account of cost of pumping. Rept. by Engr., Dec. 3, '96.

83. **BROCKPORT AND HOLLEY,** Monroe and Orleans Cos. (Brockport, 3,742; Holley, 1,881.) Built in '90 by Brockport Water-Works Co. (See note below.) SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Buffalo; one water power, other steam. STAND-PIPE.—Cap., 250,000 galls. DISTRIBUTION.—Mains, 16 miles. Taps, 290. Meters, 90. Hydrants, 101. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $175,000. Cap. Stock, authorized, $85,000; all paid-up. Bonded debt, $135,000, at 6%; $15,000 more authorized but not created. Revenue, $9,885: Consumers, unmetered, $6,100; city, $3,775; $2,650 from Brockport, $1,125 from Holley. NOTE.—No official report since June 24, '91. Press rept. Feb., '94, stated that Consolidated Water Supply Co. had been incorp. with cap. of $750,000 by Wm. F. Ross, of Rochester, and others to operate works at Brockport, Clyde, Holley, Medina and Palmyra, control of stock of Cos. at these places having been obtained by new Co.

34. **BROCTON,** Chautauqua Co. (Est., 812.) Built in '96 by village. Engr., E. A. Wilder, Fredonia. Contrs., Prout & Swanson, Jamestown. SUPPLY.—Springs 1½ miles south of village (by gravity?) from impounding reservoir. DISTRIBUTION.—Taps, 73; made by village. Services, galv. i.; paid for by consumer. Meters, 1; owned and controlled by village; repairs paid by consumer. Use of meters not optional with consumer; compulsory for R. R. Hydrants, 52. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $29,000. Rept. by J. H. Cobb, Village Clerk.

215. **BRONXVILLE,** Westchester Co. (Est., 409.) See New Rochelle.

35 to 39 B. **BROOKLYN,** Kings Co. (838,547.) Brooklyn now includes the whole of Kings County; Flatbush, Gravesend and New Utrecht having been annexed in 1894, and Flatlands Jan. 1, 1896. Flatbush became the 29th Ward; New Utrecht, 30th; Gravesend, 31st; Flatlands, 32d. This annexation increased area of city from 28.99 to 66.39 sq. miles; also added several water-works to the two previously within the city limits, as follows: Flatbush Water-Works Co., supplying town of Flatbush; Gravesend municipal plant, supplying Coney Island and Sheepshead Bay; New Utrecht Water-Works Co., supplying Bath Beach, Bay Ridge and Fort Hamilton, all villages in New Utrecht town; and the Blythebourne and West Brooklyn Water Co., supplying small sections of city.

CITY WORKS: MAIN DIVISION.

Built in '56-9, city buying stock Nassau Water Co., which had let contract for works for about $4,000,000, but had not begun construction. SUPPLY.—Surface and ground water, pumping to reservoir, with repumping to reservoir and stand-pipe for high service. The surface water supply is collected in impounding reservoirs, or ponds, and the ground water is secured from wells, mostly driven wells, but there are a few deep and a few dug wells. CONDUITS.—Original: Masonry, 12.39 miles long, leading from Ridgewood pumping station easterly to or near Rockville Center; dy. cap., when in good repair, 75,000,000 gallons for lower 4¾ miles, then diminishing as ponds are passed. New Conduits: In '89-92 supply was developed east of original drainage area by means of new ponds and a brick conduit 37,437 ft. long, with theoretical capacity of 59,000,000 galls. at lower end. From west end of brick conduit a 48-in. c. i. force main, about 14 miles long, leads to Ridgewood pumping station, paralleling original conduit, after reaching it. A 36-in. c. i. force main, 7,988 ft. long, was built from the Milburn pumping station to connect with the old conduit. PUMPS.—Four classes: (1) Sub-stations, lifting water from wells and also from ponds below conduit level to conduit. (2) Milburn station, connected with force main from conduit extension to Ridgewood pumping station. (3) Ridgewood station, where the whole supply is pumped to the Ridgewood reservoir. (4) Mt. Prospect high service, pumping from mains to Mt. Prospect reservoir and tank. Sub-station.—Combined cap., 67,000,000 galls., of which 44,000,000 lift water from driven wells, and 23,000,000 from ponds. Spring Creek: 2—3,000,000 Knowles hor. comp. dup., lifting water from driven wells. Baiseleys: 2—3,000,000 Knowles do. Jamesco: 5,000,000 hor. triple exp. Davidson, lifting from Baiseley's Pond; 6,000,000 Andrews vert. triple exp. crank and fly wheel, and 6,000,000 Worthington hor. comp. dup., both lifting from driven wells. Springfield: 5,000,000 Davidson hor. comp. dup., lifting from Springfield Pond. Forest Stream: 2—5,000,000 Knowles hor. crank cross comp. dup., lifting from driven wells. Clear Stream: 2—5,000,000 Knowles do. Watt's Pond: 3,000,000 Worthington comp. dup. Smith's Pond: 2—5,000,000 Davidson comp. dup., lifting from Smith's Pond. Milburn Station.—Cap., 55,000,000 galls.; 4—10,000,000 and one 4,000,000 Davidson hor. triple exp. Ridgewood Stations.—Combined cap., 110,000,000 galls., which will be increased to 125,000,000 by changes now in progress, noted below. Old Station: 4—15,000,000; three of special make and one Davidson hor. comp. dup. The three special pumps are to be replaced by 3—20,000,000 Worthington vert. triple exp. high duty, now under construction. New Station: 5—10,000,000 Worthington vert. comp. dup. high duty. Mt. Prospect High Service.—Cap., 11,500,000 galls.; 5,000,000 and 4,000,000 Wright vert. beam and fly wheel, larger one being comp. and smaller simple; 2—1,250,000 Davidson hor. triple exp. Bituminous and anthracite coal used; av. cost, $2.80 to $3.20 per short ton, delivered. RESERVOIRS.—Cap., 1,604,489,500 galls. Supply Ponds: 264,489,500; 15 ponds. Hempstead Storage: 1,000,000,000. Distributing: Ridgewood, 360,000,000; Mt.

Prospect high service, 20,000,000. STAND-PIPE.—Cap., 112,000; w. i., 16 × 75 ft., enclosed in masonry; on bank of Mt. Prospect reservoir; bottom 200 ft. above tide.

FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 513 miles; cost extensions met by resolution of city. Taps, 103,322; made by water purveyor for 50 cts. for permit and cost of tap. Services, lead; paid for by consumer. Meters, 2,527; owned partly by city and partly by consumers; controlled and repaired by city at consumer's expense. Use of meters compulsory for manufacturing and business purposes. City can compel use of meters and any consumer may have one. Hydrants, public, 5,481; private, unknown. CONSUMPTION.—(Galls.) av., 80,124,432; max., 101,452,901 (in winter), 85,850,101 (in summer). PRESSURE.—Ordinary, 30 lbs. Steam fire engines are used. Bonded debt, $16,196,000. Sinking Fund, $1,429,646. Expenses, $1,521,656: Operating, $761,717; int., $759,939. Revenue, $1,522,381. Consumers, unmetered, $1,161,007; metered, $361,374. MANAGEMENT.—Comr. Cy Wks., Theo. B. Wilhs; Engr. Dept. Cy. Wks., Peter Milne; Regr., Augustus C. Tate; Engr. Water Supply, I. M. de Varona. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News: General, March 19, 26, '81; stand-pipe enclosed in masonry tower, illus., Feb. 7, '91; new supply, March 7, May 9 and July 25, '91; Davidson pumps at Millburn (new supply) station, March 12, '92, illus. and inset; driven well plants, Sept. 14, '93; boilers, Aug. 23, '94, illus. Repts. on proposed additional supply, Feb. 13, 20, '96. Ridgewood pumping station new steel chimney, Jan. 28, '97.

PROJECTED IMPROVEMENTS.—Contract let in summer of '96 for 66-in. steel conduit, 74,500 ft. long, which, with two 48-in. c. i. conduits, 4,400 ft. long, joining steel pipe on east, will extend from Millburn to Ridgewood pumping station, parallel to masonry conduit and force main.

CITY WORKS: GRAVESEND DIVISION.

Owned by the city since Jan., '95. In '80 Coney Island Water-Works Co. built works, which came into possession of Kings County Water Supply Co. in '85, and were extended to supply New Utrecht. In '89 town of Gravesend built a plant to supply the villages of Coney Island and Sheepshead Bay, and the supply from the Kings County Co. was shut off. In '92 or '93 this Co. was absorbed by New Utrecht Water Co. In '95 Gravesend plant came into possession of the city of Brooklyn through annexation, and Jan. 1, '96, the New Utrecht plant was acquired by the same city by purchase (see below). SUPPLY.—From 113 2-in. driven wells, pumping direct. Dy. cap. of wells, 2,500,000 galls. PUMPS.—Cap., 6,000,000 galls.; 4,000,000 Deane comp. cond. dup., 2,000,000 Worthington comp. cond. Anthracite pea coal used; av. cost, $3.25 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 17 miles; cost extensions met by bonds. Taps, 1,200; made by city for $3.50 for ordinary tapping exclusive of paving charges. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, 152. CONSUMPTION.—(Galls.) av., 2,000,000; max., 2,500,000; min. 1,500,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $450,000 (city paid about $425,000 for works). MANAGEMENT.—See above. Rept. by J. H. Decker, Depy. Water Purveyor, Sept. 30, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Mar. 3, '83; Oct. 16, 23, '86; Oct. 6, '88; Mar. 16, '93; stand-pipe accident, Apr. 12, '94.

CITY WORKS: NEW UTRECHT DIVISION.

Owned by city since Jan. 1, '96; see history under Gravesend Division. SUPPLY.—24 4-in. tubular wells and 10 open wells, each 8 × 35 (est.) ft., pumping direct. PUMPS.—Cap., 5,000,000 galls.; 2—2,500,000 Worthington comp. cond. high duty. Anthracite pea coal used; av. cost, $3.25 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 35 miles; cost extension met by bonds. Taps, 1,250; made by city for $3.50, for ordinary taps, exclusive of paving. Services, lead; paid for by consumer. Meters, 60; owned by both city and consumer; controlled by city; repairs paid by consumer. Use of meters compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 10. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,500,000; min., 900,000. PRESSURE.—Ordinary, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $415,000 (city paid Co. $205,855 for works). MANAGEMENT.—See above. Rept. by J. H. Decker, Depy. Water Purveyor, Sept. 30, '96. SEWERS.—Has sanitary and storm sewers.

LONG ISLAND WATER SUPPLY CO.

Built in '81 to supply town of New Lots, which in '86 was annexed to Brooklyn as 26th ward; 50-year charter, 25-year hydrant contract. Act annexing New Lots to Brooklyn provided that latter might buy works, and that until city did so, or Co.'s charter expired, city should not lay mains in this section. Above act also provided that in case Co. and city could not agree on purchase price latter could take property by eminent domain within two years; also that in case works came into possession of city latter should assume bonded indebtedness of $500,000 at 6%, $250,000 secured by first mortgage, dated Dec., '81, and $250,000 secured by second mortgage, July, '85. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for fire hydrants. LEGAL DIFFICULTIES.—Dec. 22, '90, Mayor, Comptroller and Auditor contracted with Co. to buy works, assuming the $500,000 of 6% bonds mentioned above, and paying $750,000, or $300 per $100 share, in 10-20 years 3% bonds. Wm. Ziegler, a taxpayer, obtained injunction to prevent purchase. Matter was carried to Court of Appeals, where it was

decided that purchase was illegal, owing to the fact that the two years named in annexation act (see above) had expired. In '92 city obtained legislation providing for purchase of works by it, price to be determined by five appraisers. Majority (3) of appraisers rept. Jan. 24, '93, fixing price at $570,000. Co. was not satisfied with amount and Court set aside award. City took case to Court of Appeals, which reversed decision of lower court and sustained award. Co. appealed to U. S. Supreme Court, where matter still was at latest repts. SUPPLY.—Wells, pumping to reservoir. There are 13 6-in. and 22 2-in. driven wells; also one dug well, 25 × 25 ft., with 4 6-in. pipes in the bottom. PUMPS.—Cap., 24,000,000 galls.; 4—6,000,000 Davidson. Wilkesbarre anthracite coal used; av. cost, $4.50 per short ton. RESERVOIR.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED Apr. 30, '95. DISTRIBUTION.—Mains, 45 miles; cost extensions met by Co. Taps, 6,000 to 7,000; made by Co. for $3.50, ordinary taps in paved streets. Services, lead or galv. i.; paid for by consumer. Meters, 25; owned, controlled and repaired by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 655; private, 18 (12 of which are given free to city in lieu of fountains). CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 50 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, $250,000. Bonded debt, $500,000. No sinking fund. MANAGEMENT.—Prest., J. McCoy Gray; Secy. and Treas., Jas. J. Moran; Ch. Pump. Engr., John Fulton. Rept., Sept. 11.

FLATBUSH WATER-WORKS CO.

Built in '82 by Flatbush Water-Works Co. Flatbush was annexed to city of Brooklyn in '95 as the 29th ward. Est. pop. of ward, 17,000. SUPPLY.—Open and driven wells, "Stephens' patent system," pumping to stand-pipe. PUMPS.—Cap., 7,500,000 galls.; two Worthington comp. cond., 2,500,000 and 5,000,000. STAND-PIPE.—Cap., 239,700 galls.; iron, 20 × 102 ft. FISCAL YEAR CLOSED April 30, '96. DISTRIBUTION.—Mains, 55.4 miles. Taps, 2,267. Services, lead. Meters, 26. Hydrants, public, 555; private, 35. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Nicholas Cooper; Secy., John Z. Lott; Supt., Jeremiah Lott, 785 Flatbush ave. Rept. by Supt., Jan. 5, '97. REFERENCE.—Eng. News, Mar. 3, '83.

BLYTHEBOURNE WATER CO.

Supplies a small section of the city. Address Co. at Real Estate Exchange.

WEST BROOKLYN WATER CO.

Built in '86. SUPPLY.—Wells, 70 ft. deep, pumping to tanks. PUMPS.—Worthington. TANKS.—Cap., 54,000 galls.; 3—18,000. DISTRIBUTION.—Mains, 3¾ miles. Taps, 170. Hydrants, 5. CONSUMPTION.—(Galls.) av., 30,000. FINANCIAL.—Cap. Stock, authorized, $50,000; paid-up, $27,000. No debt. MANAGEMENT.—Prest., M. McCormack, 135 Pearl St., N. Y. City; Secy. and Supt., Geo. A. Allin, 49th St. and New Utrecht Ave. Rept. by Secy., Feb. 18, '97.

215. **BROWNSVILLE,** Westchester Co. In East Chester town. Supplied by New Rochelle Water Co.

40. **BUFFALO,** Erie Co. (255,664.) Bought by city in '68 for $705,000; built in '52 by Co. SUPPLY.—Niagara River pumping direct and to reservoir. Intake Tunnels: One 4 ft. diam., 330 ft. long, bought with old works; one 6 ft. diam., 1,020 ft. long, built in '74; one 9 ft. diam., built in '96; total daily cap., 315,000,000 galls. PUMPS.—Cap. (Feb. 1, '97), 157,500,000 galls.; three Worthington comp. cond.: One 12,500,000 hor., 2—20,000,000 (see below). Four Holly-Gaskill hor. high duty: 1—15,000,000, 3—20,000,000. One 30,000,000 Hammond. The Worthington pumps were enlarged '96-7, the 12,500,000 from 10,000,000, and the 2—20,000,000 from 15,000,000; were to be finished by Feb. 1. (Makers report that 4,000,000 and 6,000,000 Holly quarduplex, in addition to above, are held in reserve at old station.) Bituminous coal used; av. cost, $1.50 per short ton. RESERVOIRS.—Cap., 250,000,000 galls. Storage and distributing: 135,000,000; water, 31 to 40 ft. deep; built in '90-2. Distributing: 116,000,000; area, 20 acres; water, 30 ft. deep; 117 ft. above Niagara River. Finished July 6, '94; cost, $557,356, including fence and sidewalk. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 450 miles; cost extensions met by rentals. Taps, 48,000. Services, lead; paid for by consumer. Meters, 400; owned, controlled and repaired by city. Hydrants, 4,200. CONSUMPTION.—(Galls.) av., 100,000,000. PRESSURE.—Ordinary, 50 to 70 lbs. FINANCIAL.—Cost, $8,155,485. Bonded debt, $8,575,882, at 3½ to 7%: $679,382 at 7%, due from 1903 to 1909; $100,000, at 6%, due '96; $250,000, at 5 %, due from '98 to '99; $504,000, at 4%, due 1904 to 1911; $2,042,500, at 3½%, due 1896 to 1914. Expenses: Operating, $231,340; int., $164,879. Bonds paid, $80,000. Revenue, $642,023; Consumers, unmetered (also misc. rev.), $533,716; metered, $59,894; City, $29,307. MANAGEMENT.—Bd. Pub. Wks.: Jas. Mooney, Prest.; Chas. G. Pankow, Marcus M. Drake. Supt., Francis G. Ward; Engr., Louis H. Knapp. Rept. by Engr., Aug. 14, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 30, '81; new storage and distributing reservoir, Jan. 10, '91; intakes, May 9, '95.

41. **BURKE,** Franklin Co. (2,072, town.) Built in '83 by Burke Water Co. Supply, spring, by gravity. Fiscal year closed March 30, '96. Mains, 1½ miles. Taps, 43; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Cost, $3,000. Cap. Stock: Authorized, $1,000; all paid-up; paid 8% div'd in '96. Expenses: Operating, $16;

taxes, $5. Revenue: Consumers, $494. Prest., O. M. Everett; Secy. and Treas., C. H. Everett; Supt., M. O. B. Smith. Rept. by Secy. No sewers.

D 4. **CADOSIA,** Delaware Co. (est., 50.) Built in '90 by Cadosia Water Co.; 99 yrs. franchise. Supply, spring brook, by gravity. Reservoir, cap., 70,000 galls. Mains, 1 mile. Taps, 6. No meters or hydrants. Pressure, 38 lbs. Cost, $13,000. Bonded debt, $5,000, at 6%. Cap. Stock: Authorized, $5,000; all paid-up. Operating expenses, $50. Revenue: Consumers, $980; City, none. Prest., G. N. Cowan; Secy. and Treas., J. B. Cowan; both of Stamford; Supt., C. H. May. No rept. since '90-1 Manual.

D 13. **CALDWELL,** Warren Co. Lake George P. O., which see.

P 6. **CALEDONIA,** Livingston Co. (2,188, town.) In Nov., '96, $20,000 was voted for municipal works. Bids for constructing works were to be received Mar. 9, '97. Supply, wells, pumping to stand-pipe. Engr., J. F. Witmer, Buffalo.

42. **CAMBRIDGE,** Washington Co. (1,598.) Built in '86 by Cambridge Water-Works Co. FRANCHISE.—20 yrs. from '86; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,350 per yr. SUPPLY.—Springs, pumping from collecting to distributing reservoirs. PUMPS.—Cap., 480,000 galls.; Worthington. Anthracite coal used; av. cost, $5.50 per short ton. RESERVOIRS.—Cap., 5,000,000 galls.; two, 2,000,000 and 3,000,000. FISCAL YEAR CLOSED Apr. 9. DISTRIBUTION.—Mains, not given; cost extensions met by revenue. Taps, 126; made by consumer. Services, galv. i.; paid for by owner of property. Meters, 17; owned by Co. Co. can compel use of meters and any consumer may have one. Meters are being introduced as rapidly as possible. Hydrants, 33. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $48,000. Cap. Stock, authorized, $40,000; all paid-up; paid 2% div'd. Bonded debt, $28,000, at 5%, due 1906. No debt. Expenses, $1,817: Operating, $233; int., $1,400; taxes, $184. Revenue, $3,800: Consumers, $2,450; City, fire protection, $1,350. MANAGEMENT.—Prest., Wm. McKie; Secy. and Supt., C. F. Hawley; Treas., T. C. Gifford; Ch. Pump. Engr., H. K. Wood. Rept. by Supt., Sept. 29. SEWERS.—None.

43. **CAMDEN,** Oneida Co. (1,902.) Built in '86 by village. SUPPLY.—Emmons Brook, by gravity from impounding and storage reservoir. RESERVOIRS.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by bonds. Taps made by village for $1. Services, iron; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, 60. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 75 to 80 lbs. FINANCIAL.—Cost, $42,000. Bonded debt, $20,000, at 3½%, due in 20 yrs; $20,000, at 3½%, due in 40 yrs. No sinking fund. Expenses, $1,550; operating, $250; int., $1,300. Revenue: Consumers, $2,376; City, none. MANAGEMENT.—Prest., James S. Raymond; Secy., Geo. J. Skinner; Treas., Geo. W. Young; Supt., Henry B. Clark. Rept. by Secy., July 13. SEWERS.—None.

44. **CANAJOHARIE,** Montgomery Co. (2,089.) Now owned by Canajoharie Consolidated Water Co. Built in '52 by Canajoharie Water-Works Co., and in '81 by Cold Spring Water Co.; both plants sold to the Canajoharie Consolidated Water Co. in '88 and '89, respectively. SUPPLY.—For domestic use, springs collected in catchment basin, by gravity and pumping to tank for high service; for fire protection, pond, by gravity, with spring, pumping to tank for high service. PUMPS.—Rumsey & Co., Knowlson & Kelly. RESERVOIR.—Cap., 260,500 galls.; filled by overflow from tank. DISTRIBUTION.—Mains, 3.5 miles. Taps, 121. Services, lead. Meters, 0. Hydrants, 17. CONSUMPTION.—(Galls.) av., 577,592. PRESSURE.—Ordinary, 50 to 60 lbs. FINANCIAL.—Cap. Stock, authorized, $25,000; all paid-up; paid 2% div'd in '95. No debt. Expenses, $409: Operating, $384; taxes, $25. Revenue, $2,112: Consumers, $1,712; town, fire protection, $400. MANAGEMENT.—Prest., Jas. Arkell; V.-Prest., William Hatter; Secy., Treas. and Supt., Randolph Spraker. Rept. by Supt., Aug. 12. SEWERS.—None. NOTE.—Above figures are taken from '90-1 Manual. Supt. writes that they "will answer for the new issue." REFERENCE.—Eng. News, Jan. 21, '82.

45, 46. **CANANDAIGUA,** Ontario Co. (5,868.).

CANANDAIGUA WATER-WORKS CO.

Built in '84. SUPPLY.—Lake Canandaigua, pumping to tank. PUMPS.—Cap., 4,500,000 galls.; 2—2,250,000 Worthington, a comp. cond. and a non-comp. non-cond. TANK.—Cap., 380,000 galls.; 40 × 40 ft.; 135 ft. above village. DISTRIBUTION.—Mains, 14 miles. Taps, 425. Meters, 6. Hydrants, 100. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 72 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $185,000. Debt, $161,000, at 6%. Expenses, $14,760: Operating, $5,100; int., $9,660. Revenue, $22,100 (?): Consumers, unmetered, $17,500 (?); City, fire protection, $4,600. NOTE.—No rept. received since '90-1 Manual. REFERENCE.—Eng. News, July 26, '84.

VILLAGE PLANT.

Built in '95 by the village; put in operation July 1. Engr., W. T. Randall, Syracuse. Contrs., W. T. O'Connor & Co., Syracuse. Village voted in '94 to build municipal works. Co. contended that village had no right to do so. Courts decided in favor of municipality. SUPPLY.—Canandaigua Lake, pumping to distributing reservoir. PUMPS.—Gould trip. 10 × 12 in., driven by electric motor. New Pardee coal used; av. cost, $2.25 per short

ton. RESERVOIR.—Cap., 3,100,000 galls.; elev., 300 ft. DISTRIBUTION.—Mains, 28 miles; cost extensions met by income. Taps, 400; made by village, free. Services, galv. i.; paid for by consumer. Meters, 27; owned, controlled and repaired by village; no rental. Use of meters compulsory for saloons and motors. Village can compel use of meters and any consumer may have one. Hydrants, 160. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $180,000. Bonded debt, $130,000, at 4%. Expenses, $5,600: Operating, $400; int., $5,200. Revenue, $9,400: Consumers, $4,200; City, $5,200. Deficits are met by general tax. MANAGEMENT.—Prest., C. F. Robertson; Secy. and Treas., Edward G. Hayes; Supt., Thos. Johnson; Ch. Pump. Engr., I. P. Wykoff. Rept. by Supt., June 6. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Electric pumping plant, Eng. News, Sept. 26, '95.

47. **CANASERAGA,** Allegany Co. (659.) Built in '95 by village; put in operation Dec. 1. Engr., E. D. Smalley, Syracuse. Contrs., Geo. T. Rehn & Co., Hornellsville. SUPPLY.—Springs, by gravity from collecting reservoir. RESERVOIRS.—Cap., 371,500 galls.; small covered collecting reservoir near springs, 1,500; storage, 3,500 ft. from center of village, 370,000. DISTRIBUTION.—Mains, 4¾ miles. Taps, 82; made by village to curb line for $7. Services, galv. i.; paid for by owner of property. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, 28. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $14,100, at 4%, due Oct. 1, 1915. Expenses: Int., $564. Revenue: Consumers, $225 (est.) MANAGEMENT.—Prest., J. A. Daley; Secy., A. T. Peabody; Treas., S. J. Craig. Rept. by F. O. Jones, Village Clk., Sept. 1. SEWERS.—None.

48. **CANASTOTA,** Madison Co. (2,774.) Built in '85 by village. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 7,000,000 galls. DISTRIBUTION.—Mains, 10 miles. Taps, 250. Meters, 0. Hydrants, 54. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $70,000. Bonded debt, $70,000, at 4%. Expenses, $3,300: Operating, $500; int., $2,800. Revenue: Consumers, $2,500. MANAGEMENT.—Supt., Judson Field.

49. **CANISTEO,** Steuben Co. (2,071.) Built in '87-8 by Canisteo Water-Works Co. FRANCHISE.—30 yrs. from '87; provides for purchase of works by city in '97 and every 10 yrs. thereafter; price to be decided by arbitration. Rates are fixed in franchise. Co. is exempt from local taxes. City paid $15,000 at time of building the works as compensation for public service. SUPPLY.—Springs, by gravity to and from reservoir. FILTERS.—Gravel. RESERVOIR.—Cap., 2,000,000 galls.; 1½ miles from village. DISTRIBUTION.—Mains, 7 miles; cost extensions met by revenue. Taps made by Co. Services, galv. i. and lead. Meters, 10; owned by consumers. Use of meters optional with Co. Hydrants, public, 51; private, 1. PRESSURE.—Ordinary, 71 lbs. FINANCIAL.—Cap. Stock, Authorized, $25,000; all paid-up. Floating debt, $10,000, at 2% (?); Bonded, $20,000, at 6%. Revenue: City, fire protection, $10; street sprinkling, $50. MANAGEMENT.—Prest. and Supt., O. O. Laine; Secy., De Merville Page, Hornellsville; Treas., Wm. G. Porter. Rept. by Supt., Aug. 20. SEWERS.—None.

50. **CANTON,** Saint Lawrence Co. (2,580.) Built in '89 by village. SUPPLY.—De Grasse River, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls. Deane comp. dup. Bituminous coal used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 170,000 galls.; 20 × 72 ft.; 180 ft. above business portion of village. FISCAL YEAR CLOSED Nov., '95. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by income. Taps, 315; made by village for $2.50 each. Services, galv. i.; paid for by owner of property. Meters, 1. Hydrants, 56. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 3½%. Sinking Fund, $2,500, invested in U. S. bonds. Expenses, $4,200: Operating, $2,800; int., $1,400. Revenue, $5,500: Consumers, $4,000; City, $1,500. MANAGEMENT.—Prest., J. H. Rushton; Secy., Isaac Cornell; Treas., W. S. Leonard; Supt., J. H. McIntosh; Ch. Pump. Engr., L. R. Smith. Rept. by Supt., July 10. SEWERS.—Has sanitary and storm sewers.

51. **CAPE VINCENT,** Jefferson Co. (1,824.) Built in '96 by village. Engrs., Hinds & Bond, Watertown. Contrs., Beckwith & Quackenbush, Herkimer. SUPPLY.—St. Lawrence River, pumping to stand-pipe. Intake, 650 ft. long. PUMPS.—Cap., 1,000,000 galls.; Knowles or Blake. Bituminous coal used; av. cost, $2.75 per short ton. TANK.—Cap., 94,000 galls.; iron; 20 × 40 ft. Taps., 150; made by village, no charge. Services, galv. i.; paid for by village. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, 47. CONSUMPTION.—(Galls.) av., 25,000. FINANCIAL.—Cost, $25,000. Bonded debt, $25,000, at 4%. MANAGEMENT.—Prest and Treas., S. M. Pease; Secy., J. A. Scobell; Ch. Pump. Engr., Levi Millard. Rept. by S. M. Pease, Sept. 8. SEWERS.—Has sewers.

52. **CARTHAGE,** Jefferson Co. (Est., 2,278.) Built in '93 by village. Engr., C. O. Macomb, Watertown. Contrs., Moffett, Hodgkins & Clarke. Supplies West Carthage, which owns its distribution system and pays $500 a year. FRANCHISE.—Rates are subject to regulation by city. Co. is exempt from local taxes. SUPPLY.—Black River, by pumping. PUMPS.—Cap., 1,382,400 galls.; 2 Buffalo water power. STAND-PIPE.—Cap., 250,000 galls.; 20 × 75 ft.; on solid rock foundation. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income. Taps, 288; made by village at $4.50 for ¾-in. tap;

$5.25 for 1-in. tap; $7.00 for 1¼-in., including lead connections. Services, galv. i.; paid for by consumer. Meters, 20; owned by consumer, controlled by village; repairs paid by consumer. Village can compel use of meters and any consumer may have one. Hydrants, 97. CONSUMPTION.—(Galls.) av., 70,000. PRESSURE.—Ordinary, 40-90 lbs. (stand-pipe). One Silsby steam fire engine held in reserve. FINANCIAL.—Bonded debt, $50,000, at 4%. MANAGEMENT.—Prest., F. S. Hubbard; Secy., W. K. Wrape; Treas., E. H. Myers; Supt. and Ch. Pump. Engr., T. J. Quinn. Rept. by Supt., June 10. SEWERS.—None.

53. **CASTILE,** Wyoming Co. (1,146.) Built in '88-9 by Castile Water-Works Co. Has supplied Silver Springs since '89. FRANCHISE.—Provides for purchase of works by village at any time. Rates are not fixed in franchise nor subject to regulation by village. Press rept., Jan., '95, stated 10-yr. contract had just been made, village to pay $1,000 per yr. for fire protection and to have water for two water troughs, school house and fire house free. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 233,000 galls. (in '89). FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 130. Meters, 0. Hydrants, 32. CONSUMPTION.—Unknown. FINANCIAL.—Cost, $39,000. Cap. Stock, authorized, $15,000; all paid-up; paid no div'd for fiscal year. Bonded debt, $17,000, at 6%. Sinking Fund, $300. Expenses, $1,470: Operating, $300; int., $1,020; taxes, $150. Revenue, $2,200: Consumers, $1,100; City, $1,000; other purposes, $100. MANAGEMENT.—Prest., Miles Ayrault, Tonawanda; Secy. and Supt., M. N. Cole; Treas., Geo. H. Bush. Rept. by Supt.

54. **CATSKILL,** Greene Co. (4,920.) Built in '84 by village. SUPPLY.—Hudson River, pumping to reservoir. PUMPS.—Cap., 3,000,000 galls.; two Davidson comp. cond. RESERVOIR.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 12 miles. Taps, 794. Hydrants, 113. CONSUMPTION.—(Galls.) av., 621,850. PRESSURE.—(In '89.) Ordinary, 95 lbs.; fire, 180 lbs. FINANCIAL.—Debt, $157,000. Expenses, $7,369. Int., $6,480. Revenue, $7,981. MANAGEMENT.—Water Comrs. Prest., W. S. Winans; Secy., John L. Driscoll; Treas., Chauncey Smith; Supt., Wm. Comfort. Rept. by Supt., Sept. 29. REFERENCE.—Eng. News, Jan. 17, '85.

55. **CATTARAUGUS,** Cattaraugus Co. (878.) Now owned by village. First supplied in '90 by Cattaraugus Water Co. In '94 village built works, putting them in operation Dec. 1. Engr., Wm. J. White, Buffalo. Contr., Wm. B. Wilson, Buffalo. Co. tried to prevent building village works, but courts decided against it. Aug., '96, Co. works were bought by village at mortgage sale for $105 (bonded debt in '90 was $18,000, at 6%.) Press. rept. states Co. supply was unsatisfactory. LEGAL DIFFICULTIES.—Water Co. tried to prevent village from building works in '94; referee decided in favor of village. SUPPLY.—Mountain springs, by gravity to storage reservoir, passing first through village mains. RESERVOIR.—Cap., 500,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 9 miles; cost extensions met by income. Taps, 190; made by consumer for $2. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 22: private, 2. CONSUMPTION.—(Galls.) av., 86,400. PRESSURE.—Ordinary, 85 to 145 lbs. FINANCIAL.—Cost, $23,000. Bonded debt, $22,000, at 4%, due 1915. Expenses, $1,078: Operating, $198; int., $880. Revenue: Consumers, $1,700; City, none. MANAGEMENT.—Prest., F. S. Oakes; Secy., T. J. Farrar; Treas., E. F. Beach; Supt., Chas. Babcock; Village Clk., Orlando White. Rept. by Prest., June 8. SEWERS.—None.

56. **CASENOVIA,** Madison Co. (1,987.) Built in '90 by village. SUPPLY.—Springs, by gravity, with pumping as auxiliary. PUMP.—Gould, 6½ × 8, water power. RESERVOIRS.—Cap., 8,000,000 galls.; storage, 178 ft. above, one mile from village. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by general fund. Taps, 222; made by village to curb for $7.50. Services, lead; paid for by village. Meters, 55; owned by village mostly; controlled and repaired by village; yearly rental, 10% of cost. Village can compel use of meters and any consumer may have one. Hydrants, 45. CONSUMPTION.—(Galls.) av., 80,000; max., 100,000; min., 60,000. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $43,000. No sinking fund. Revenue: Consumers, $1,200. MANAGEMENT.—Prest., Edgar C. Bass; Secy and Treas., Wm. Watkins; Supt., M. E. Card. SEWERS.—Has sanitary sewers only.

—† **CENTRAL VALLEY,** Orange Co. (Est., 600.) Nov. 21, '95, Geo. Cornell rept. that works were about completed by Central Valley & Highland Mills Water Co., of which W. H. Cowan, Stamford, was Prest. Press rept. Oct. 21, '95, stated that supply was to be taken from Cromwell Lake, and that citizens were objecting to source.

57. **CHAFEE,** Erie Co. (Est., 112.) Built '96-7 by Chafee Water-Works Co., for general supply; practically completed Jan. 5. SUPPLY.—Drilled well, pumping to tank. PUMP.—Driven by aermotor. TANK.—Cap., about 15,000 galls.; 64 ft. high. FINANCIAL.—Cost, est., $2,000. Cap. Stock, Authorized, $2,000. MANAGEMENT.—Rept. by R. L. Willis, Secy. and Treas.

58. **CHATEAUGAY,** Franklin Co. (1,172.) Built in '80 by Chateaugay Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Spring, by gravity. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 1½ miles. Taps, 150. Services, galv. i.; Meters, 0. Hydrants, 25. PRESSURE.—Ordinary (in '89), 45 to 60 lbs. FINANCIAL.—Cap. Stock, $10,000. No debt. Expenses, $238: Operating, $100; taxes,

$138. Revenue: City, $500. NOTE.—No report since '90-1 Manual. REFERENCES.—Eng. News, April 29, '82.

59. **CHATHAM,** Columbia Co. (1,912.) Built in '86 by Chatham Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup. RESERVOIRS.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 7 miles. Taps, 125. Services, galv. i. Meters, 0. Hydrants, 36. PRESSURE.—(In '89) Ordinary, 80 lbs.; fire, 125 lbs. FINANCIAL.—Cap. Stock, $100,000. NOTE.—No report since '90-1 Manual.

60. **CHERRY VALLEY,** Otsego Co. (685.) Completed by village Dec. 12, '96. Engr., J. Warren Lamb, Cooperstown. Contr., Geo. Monahan, Richfield Springs. SUPPLY.—Reservoir, 1½ miles east of village, by gravity. DISTRIBUTION.—Taps, not determined. Hydrants, 29. FINANCIAL.—Cost, $18,500. Bonded debt, about $18,000. MANAGEMENT.—Comrs.

61. **CHESTER,** Orange Co. (2,112.) Built in '93 by village. Engr., J. B. Rider; Contr., Francis Leonard, both of Norwalk, Conn. Supplies Greycourt. SUPPLY.—Walton Lake, by gravity. Lake has cap. of 399,000,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 123; made by village for $2. Services, lead; paid for by property owner. Meters, 1; owned, controlled and repaired by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 36; private, 1. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $53,000. Debt, $98,000, at 4%; $48,000 due 1917, $5,000 due 1903. Expenses, $2,187: Operating, $67; int., $2,120. Revenue: Consumers, $2,900. MANAGEMENT.—Prest., W. A. Lawrence; Secy., G. M. Vail; Treas., Geo. M. Roe; Supt., F. L. Conklin. Rept. by Secy.

P 7. **CLAYTON,** Jefferson Co. (1,748.) Plans have been prepared by Hinds & Bond, Watertown, for municipal works to be supplied from St. Lawrence River, by pumping to stand-pipe.

62. **CLIFTON SPRINGS,** Ontario Co. (1,297.) Built in '96 by village; put in operation July 1. Engr., J. F. Witmer; Contr., W. B. Wilson, both of Buffalo. SUPPLY.—Springs, four miles distant, by gravity. RESERVOIRS.—Cap., 3,000,000 galls.; storage and distributing, two miles from, 282 ft. above village. Press rept. Dec. 31, '96, stated that embankment had given way to within 10 ft. of bottom. DISTRIBUTION.—Mains, 9½ miles. Taps, 93. Services, iron; paid for by consumer. Meters, 96; owned, controlled and repaired by consumer. Use of meters compulsory for all consumers. Hydrants, 58. PRESSURE.—Fire, 95 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $50,000, at 4%, due 1916. No sinking fund. MANAGEMENT.—Prest., N. B. Briggs; Secy., H. S. Allis; Treas., Frank Lindner. Rept. by Prest., Nov. 6. SEWERS.—None.

63. **CLINTON,** Oneida Co. (1,269.) Built in '84 by village. SUPPLY.—Miller brook, by gravity from impounding reservoir. RESERVOIR.—Cap., 3,000,000 galls.; 2½ miles from and 236 ft. above village. DISTRIBUTION.—Mains, 5. Taps, 103. Hydrants, 40. PRESSURE.—Ordinary (in '89), 85 to 100 lbs. FINANCIAL.—Cost, $37,455. Bonded debt, $27,000, at 5%. Expenses, $1,954: Operating, $454; int., $1,500. Revenue: Consumers, $1,107. NOTE.—No report since '90-1 Manual.

64. **CLYDE,** Wayne Co. (2,688.) Built in '88-9 by Clyde Water Supply Co. (See note under Brockport, N. Y.) Press rept., March 8, '95, stated 5-yr. contract had just been made with village, latter to pay $2,000 per yr. for 58 hydrants. SUPPLY.—Flowing wells, pumping to stand-pipe. Supply originally springs; in '91 suction pipe laid to river for new or additional supply and abandoned in '95 for present supply. PUMPS.—Cap., 1,200,000 galls.; Buffalo dup. cond. STAND-PIPE.—Cap., 200,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8.5 miles. Taps, 270. Meters, 188. Hydrants, 60. CONSUMPTION.—(Galls.) av., 160,000. FINANCIAL.—Cap. Stock, authorized, $50,000; all paid-up. Bonded debt, $50,000, at 6%. Revenue: City, $2,000. MANAGEMENT.—Supt., E. M. Ellinwood. Rept. by Wm. F. Ross, Rochester, Oct. 21.

65. **COBLESKILL,** Schoharie Co. (1,822.) Built '86-7 by village. SUPPLY.—Springs and surface water, by gravity from impounding reservoir. Drainage area, 2,500 acres. RESERVOIRS.—Cap., 120,000,000 galls.; at Mineral Springs; area, 28 acres; max. depth, 24 ft. FISCAL YEAR CLOSED Aug. 1, '95. DISTRIBUTION.—Mains, 6 miles; cost extensions met by revenue. Taps, 250; made by consumer. Services, lead; paid for by owner of property. Meters, 10; owned, controlled and repaired by village. Use of meters compulsory for power purposes. Hydrants, public, 45; private, 1. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $66,700. Bonded debt, $65,000. No sinking fund. Expenses: Int., $2,061. No deficits. MANAGEMENT.—Prest., M. D. Borst; Secy., Geo. D. Harder; Treas., De Witt C. Dow; Supt., Clarence Fox. Rept. by Treas., June 5. SEWERS.—Has sanitary sewers only.

66. **COHOCTON,** Steuben Co. (3,444.) Built in '93 by village. Engr., Jas. E. Larrowe. Contr., F. G. & G. R. Sikes, Buffalo. SUPPLY.—Springs. RESERVOIR.—Cap., 225,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 184; made by village, free. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 38. PRESSURE.—Ordinary, 100 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $25,000, at 3½%, due 1913. Expenses: Operating, $100. MANAGEMENT.—Prest., N. D. Kirkmire; Secy., Treas. and Supt., A. H. Meld. Rept. by Secy.

67. **COHOES,** Albany Co. (22,509.) Bought by city in '57 and extended; built in '48 by Cohoes Mfg. Co. SUPPLY.—Mohawk River, pumping to reservoir. PUMPS.—Cap., 9,500,000 galls.; 3—2,000,000 Lang, 1—3,500,000 Holly hor., all water power. RESERVOIRS.—Cap., 74,500,000 galls.; storage: 60,000,000, 210 ft. above business part of town; two distributing, 4,500,000, and 10,000,000, 160 and 188 ft. above business part of town. FISCAL YEAR CLOSED Mar. 18. DISTRIBUTION.—Mains, not given; cost extensions met by revenue, taxes and bonds. Taps, 1,700; made by city for $3. Services, w. i. and lead; paid for by consumer or owner of building. Meters, 67; owned, controlled and repaired by city. Use of meters optional with city; compulsory for mills and large consumers. Hydrants, public, 250; private, 10. CONSUMPTION.—(Galls.) av., 4,000,000. PRESSURE.—Ordinary, 40 to 50 lbs.; fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, unknown. Expenses: Operating, $10,135; int., $12,045. Paid bonds, $3,000; paid to Sinking Fund, $3,000. Revenue, $34,809; City, fire protection, free; street sprinkling, $10; sewer flushing and public buildings, none. MANAGEMENT.—Prest., George Campbell; Secy., A. T. Kniffin; Chamberlain, Miller Hay. Rept. by Secy., Aug. 11. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 6, '83.

68. **COLD SPRING,** Putnam Co. (4,113, town.) Built in '96 by city. Engr., Francis Henry, 120 B'way, New York City. Contrs., J. W. Hoffman & Co., 20 Wall St., New York City. SUPPLY.—Margaret or Foundry Brook, by gravity. RESERVOIR.—Cap., 12,000,000 galls. FISCAL YEAR BEGAN July 4, '96. DISTRIBUTION.—Mains, 5½ miles. Taps made and service paid for by consumer. Meters, not given; owned, controlled and repaired by village; yearly rental, 10%; rents for ⅝ in. at 7c. per mo. Can compel use of meters and a consumer may have one; almost all classes use them. Hydrants, 48. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 40-80 lbs.; 2 Ross pressure reducing valves. FINANCIAL.—Cost, $50,000. Bonded debt, $50,000, at 4%, due in 1925. Sinking Fund, $200, invested in savings bank, at 3½%. Expenses, int., $2,000. MANAGEMENT.—Prest., Henry Metcalfe; Secy., Seth Secor; Treas., Alex. Spalding; Supt., G. V. Grace. Rept. by Prest., June 22. SEWERS.—None.

69. **COLLEGE POINT,** Queens Co. (6,127.) Built in '74-5 by village. SUPPLY.—Springs, pumping direct. Supply can be augmented from Fresh Meadow Brook, with drainage area of 9½ sq. miles. PUMPS.—Cap., 2,500,000 galls.; two Worthington; one 1,200,000 comp. cond. and one 1,300,000 non-comp. non-cond. RESERVOIRS.—Impounding; area about 1½ acres. DISTRIBUTION.—Mains, 15 miles. Taps, 629. Services, lead. Meters, 130. Hydrants, 60. CONSUMPTION.—(Galls.) av., 450,000. PRESSURE.—(In '89), ordinary, 55 to 60 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $213,000. Bonded debt, $213,000. Expenses, $19,910: Operating, $5,000; int., $14,910. Revenue, $15,000; City, fire protection, free. NOTE.—No report since '88-9 Manual. REFERENCE.—Eng. News, Mar. 31, '83.

D 5. **COLLINS CENTRE,** Erie Co. (2,362, town.) Built in '95 by Collins Centre Water-Works Co.; put in operation on Oct. 15. Engr. and Contr., A. J. Setter. Supply, spring, by gravity, from 50,000-gall. collecting reservoir. Fiscal year closed Feb. 1. Mains, 2¼ miles; cost extensions met by surplus and cap. stock. Taps, not given; made by Co. Services, iron; paid for by consumer. Meters, 1; owned by consumer; controlled and repaired by Co. Use of meters optional with Co.; compulsory for factory. Consumption (galls.), av., 3,000; max., 3,500; min., 1,500. Pressure, 40 to 70 lbs. Cost, $3,100. Cap. stock, paid-up, $4,000. No debt; paid 8% div'd in '96. Expenses: Operating, $100; taxes, $35. Revenue: Consumers, unmetered, $362; metered (factory), $45. Prest. and Supt., A. J. Setter; Secy., Jos. A. Setter; Treas., H. A. Reynolds. Rept. by Secy., Sept. 4. Projected improvements, stand-pipe No sewers.

36. **CONEY ISLAND,** Kings Co. See Brooklyn.

70. **COOPERSTOWN,** Otsego Co. (2,657.) Built in '35 by Cooperstown Aqueduct Association. In '76 small gravity works were built by Ed. Clark. In '79 Co. built new works. FRANCHISE.—Provides for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Otsego Lake, by direct pumping. intake, 4,000 ft. 14-in. pipe, with 60 Falcon ball joints, laid down river and in lake in '94. PUMPS.—Cap., 2,000,000 galls.; two Worthington; 2—500,000 dup. power, driven (in '89) by 50-in. Leffel turbine under 5½-ft. head; 1,000,000 simple high pressure steam. DISTRIBUTION.—Mains, 5½ miles. Taps, 280. Services, lead and w. i. Meters, 0. Hydrants, 33. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $47,000. Debt, $25,000, at 6%. NOTE.—No official report since '88-9 Manual. REFERENCE.—Eng. News, Feb. 17, '83.

71. **CORINTH,** Saratoga Co. (1,222.) Built in '95 by Dunn Water Supply Co. Engr., Jno. Burke, N. Y. City. Contrs., Flood & Sherrill, Sandy Hill. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes for two years. City to pay $50 per hydrant per yr.; this includes water for sprinkling and fountains. SUPPLY.—Mountain spring brooks. FILTERS.—Cap., not given; coke. DISTRIBUTION.—Mains, 7½ miles. Taps, 225; made by Co., free. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 25. PRESSURE.—Ordinary, 90 to 125 lbs. FINANCIAL.—Cost, $46,000. Cap. Stock: Authorized, $50,000; paid-up, $26,500. Bonded debt, $20,000, at 5%, due 1915. MANAGEMENT.—Prest. and Supt., J. I. Dunn; Secy. and Treas., H. Prior King, Glens Falls. SEWERS.—None.

72. **CORNING,** Steuben Co. (8,550.) Built in '70 by town; leased for 30 yrs. from '78 by Heermans & Lawrence. Rates are fixed in lease and subject to regulation by city. Co. is exempt from local taxes, but receives no compensation for public service. SUPPLY.—Monkey Run Creek and springs, by gravity to distributing reservoir, and by pumping direct and to reservoir. PUMPS.—Cap., 1,000,000 galls.; Martin dup. Bituminous coal used; av. cost, $2 per short ton. RESERVOIRS.—Cap., 3,500,000 galls.; 250 ft. above river. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 9 miles. Taps, made by lessees, at cost. Services, galv. i.; paid for by consumer. Meters, 230; owned, controlled and repaired by lessees. Use of meters compulsory for manufacturers and all large consumers. Lessees can compel use of meters and any consumer may have one. Hydrants, 84. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $70,000. No debt. MANAGEMENT.—Supt., H. C. Heermans; Ch. Pump. Engr., Thos. Lawrence. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 20, '81.

73. **CORNWALL-ON-THE-HUDSON,** Orange Co. (760.) Built in '95 by village. Engr., Alexander Potter, 137 Broadway, N. Y. City. SUPPLY.—Idlewild Brook, by gravity. RESERVOIR.—Cap., 61,500,000 galls.; storage, 60,000,000, formed by a dam across the valley, 45 ft. high; constructed of earth, with masonry heart-wall. Distributing, 1,500,000, on brook, below storage reservoir, formed by dam; elev., 500 ft. Supply mains, 10-in. low and 6-in. high service. DISTRIBUTION.—Mains, 8 miles. PRESSURE.—Ordinary, 120 lbs. at center of village; pressure reducer is used for lower points. Rept. by Alex. Potter, Jan. 22, '97.

74. **CORTLAND,** Cortland Co. (8,590.) Built in '84 by Cortland Water-Works Co. FRANCHISE.—Provides for purchase of works by city, price to be determined by an arbitrator. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental. SUPPLY.—Springs, pumping to tank. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington; a comp. cond. and a non-comp. non-cond. Bituminous coal used; av. cost, $2.90 per short ton. RESERVOIRS.—2—3,000,000 storage. TANK.—Cap., 369,000 galls.; 40 × 40 ft.; 125 ft. above, ½ mile from main street of village. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 16½ miles; cost extensions met by earnings. Taps, 1,000; made by consumer. Services, w. i.; paid for by consumer. Meters, 290; owned by consumer; controlled by Co.; repairs paid by consumer. Use of meters compulsory for factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 131; private, 10. CONSUMPTION.—(Galls.) av., 450,000; max., 540,000; min., 360,000. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $175,000. Cap. Stock, authorized, $100,000. Bonded debt, $150,000, at 5%, due 1907. MANAGEMENT.—Prest., T. H. Wickwire; Secy., J. P. Gray; Treas. and Supt., B. F. Taylor; Ch. Pump. Engr., M. Sheridan. Rept. by Supt., June 8. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, Jan. 17, '85; wind-indented stand-pipe, Nov. 5, '96, illus.

75. **COXSACKIE,** Greene Co. (1,611.) Built in '94 by village. Engrs., Voorhees & Witmer, Buffalo. Contr., Thos. H. Ryan, Tonawanda. SUPPLY.—Springs, by gravity. RESERVOIRS.—Storage and distributing, fromed by concrete dam, 162 ft. long, 33 ft. high, 24 ft. wide at bottom and 5 ft. wide at top. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 9¾ miles. Taps, 172; made by village for $10, including service to curb. Meters, 10; owned, controlled and repaired by village; yearly rental, 10% of cost. Use of meters compulsory for brick yards, motor, etc. Village can compel use of meters and any consumer may have one. Hydrants, public, 70; private, 2. PRESSURE.—Ordinary, 90-120 lbs. FINANCIAL.—Cost, $60,000. Bonded debt, $60,000, at 4%, due from 1904 to 1920. Sinking Fund: None at present; will have $500 at close of this fiscal year. Expenses, $3,400: Operating, $1,000; int., $2,400. Revenue, $3,600: Consumers, $2,400; City, fire protection, $1,200. MANAGEMENT.—Prest., Thos. B. Alcott; Secy., James Strang; Treas., H. A. Jordan; Supt., D. W. Morgan. Rept. by Supt., June 25. SEWERS.—None.

76. **CROTON** (P. O., Treadwell), Delaware Co. (400, est.) Built in '85 by Croton Water-Works Co. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 75,000 galls.; two impounding, 30,000 and 45,000. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 2 miles; cost extensions met by stockholders. Taps, 57; made by Co. Services, lead; paid for by consumers. Meters, 0. Co. cannot compel use of meters. Hydrants, 5. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $6,500. Cap. Stock: Authorized, $6,500; all paid-up. Floating debt, $200, at 5%. Expenses, $68: Operating, $25; int., $10; taxes, $33. MANAGEMENT.—Prest., O. C. Georgia; Secy., E. A. Baldwin; Treas. and Supt., L. Saunders, all of Treadwell. Rept. by Supt., July 17. PROJECTED IMPROVEMENTS.—Increased supply.

D 6. **CROWN POINT,** Essex Co. (3,135, town.) Built in '95 by J. E. Pond; put in operation Nov. 1. Engr., J. E. Pond. Rates are not subject to regulation by city. Owner is not exempt from local taxes and receives no compensation for public service. Supply, springs, by gravity, from 23,000-gall. reservoir. Taps, 17; made by consumer. Hydrants, private, 1. Pressure, 34 lbs. Rept. by owne, Oct. 20. Extension of 2½ miles projected. No sewers.

77. **CUBA,** Allegany Co. (1,386.) Built in '89 by village. SUPPLY.—Springs, by gravity, through distribution mains to reservoir. RESERVOIRS.—Cap., 700,000 galls.; 135 ft.

above main portion of town. FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 8.9. Taps, 128. Services, galv. i. and lead. Meters, 0. Hydrants, 39. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $32,892. Bonded debt, $32,000, at 3½%. Revenue, $3,000. MANAGEMENT.—Village Prest., H. C. Morgan; Trustees, J. A. Laning, O. F. Eaton, W. A. Bates. SEWERS.—None.

78. **DANNEMORA,** Clinton Co. (Est., 600, not including 900 prison inmates.) The works are an extension of the main that supplies Clinton Prison. The prison is supplied by means of mains leading from five reservoirs on mountain side, the farthest being about ½ mile from the prison. In '93-4 the prison authorities laid mains through the village and erected fire hydrants; the water is supplied to most of the dwellings, the water rents going to the State. Pressure, 85 to 100 lbs. Rept. by Walter N. Thayer, Agent and Warden, Jan. 18,'97.

79. **DANSVILLE,** Livingston Co. (3,758.) Present works built in '96 by village; were to be put in operation about Dec. 15. Engr., J. F. Witmer, Chapin Block, Buffalo; Contr., W. B. Wilson, 37 and 38 Lewis Block, Buffalo. In '74 village built works for fire protection. SUPPLY.—Zigenfus Mountain springs, by gravity. RESERVOIR.—Cap., 4,000,000 galls.; storage. DISTRIBUTION.—Mains, 14 miles, 12 to 4-in. c. i. Taps, 80. Services, galv. i.; paid for by consumer. Meters, 33; owned by village; repairs paid for by consumer. Village can compel use of meters. Hydrants, 112. PRESSURE.—Ordinary, 100 lbs.; fire, same. FINANCIAL.—Cost, $65,000. Bonded, $75,000, at 4½%. MANAGEMENT.—Prest., Chas. A. Snyder; Secy., Frank J. Blum; Treas., Wm. Cogswell; Supt., E. B. Cridler. Rept. by Supt., Dec. 1, '96, and J. F. Witmer, Jan. 23, '97. SEWERS.—No sewers. REFERENCE.—Eng. News, May 20, '82.

80. **DAVENPORT** Delaware Co. (1,789, town.) Built in '94 by Davenport Water Co. Engr., F. W. Roundy; Contr., Joseph Ross. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 60,000 galls. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 1¼ miles. Taps, 35; made by Supt. Services, lead; paid for by company. Meters, 0. Hydrants, 10. PRESSURE.—Ordinary, 72 lbs. FINANCIAL.—Cap. Stock, authorized, $10,250; all paid-up; paid 4% div'd. No debt. Revenue: City, fire protection, $50. MANAGEMENT.—Prest., H. S. Wickham; Secy., G. T. Scott; Treas., Wm. McDonald; Supt., E. I. Sherman. Rept. by Supt., June 9

81. **DEANSBORO,** Oneida Co. (Est., 300.) Under construction in '96 by Deansboro Water Co. Engr., E. D. Smalley, Syracuse. Contr., Chas. Brown. SUPPLY.—Springs collected in catch-basin, by gravity through distribution system to reservoir. RESERVOIRS.—Cap., 187,000 galls.; storage; for fire or unusual demands; 44 x 95 ft. at top., 22 x 72 ft. at bottom; water 8½ to 9 ft. deep. DISTRIBUTION.—Mains, 2 miles. Taps, 40; made by Co. at consumer's expense. Services, ½-in. galv. i.; paid for by consumer. Meters, 0. Hydrants, 13. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost (est.), $4,000. Cap. Stock, authorized, $4,000. MANAGEMENT.—Prest., Geo. B. Northrup; Secy., Geo. I. Hovey; Treas., B. W. Hamlin. Rept. by Secy., Nov. 13. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Nov. 19, '96.

82. **DELEVAN,** Cattaraugus Co. (Not given.) Bought in '95 by Delevan Water Co.; built in '91 by Yorkshire Water Co. Engr. and Contr., Geo. N. Cowan. FRANCHISE.—Co. not exempt from local taxes. SUPPLY.—Springs, by gravity. RESERVOIR.—20 x 30 x 8 ft. deep. Taps made by Co. Meters, 0. Hydrants, 18. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock, authorized, $14,000. Debt, $13,500: Floating, $3,500, at 6%; Bonded, $10,000, at 5%, due 1910. Expenses, $838: Operating, $53; int., $710; taxes, $75. Revenue, $1,085; City, fire protection, $270. MANAGEMENT.—Prest., E. W. Read; Secy., Fred. Kirchbell; Treas., E. J. Jackson; Supt., L. J. Cheney. Rept. by Prest. SEWERS.—Has some storm sewers

83. **DELHI,** Delaware Co. (1,564.) Probably bought by village in '97; see note below. Built in '72 by Delhi Water Co. FRANCHISE.—Does not provide for purchase of works by town. Rates are not fixed in franchise nor subject to regulation by town. SUPPLY.—Surface water, by gravity from impounding reservoir on brook. RESERVOIRS.—Cap., of original, 500,000 galls.; about ½ mile from and 90 ft. above town. New reservoir and supply main put under construction in '96 (press rept.) DISTRIBUTION.—Mains, 5 miles. Taps, 300. Services, lead. Meters, 0. Hydrants 50. CONSUMPTION.—Unknown. PRESSURE.—Ordinary (in '89), 33 lbs. FINANCIAL.—Cost, $50,000. Debt, $10,000. Expenses: Operating, $250. Revenue: Consumers, $2,000; City, none. MANAGEMENT.—Prest., Geo. N. Youmans; Secy. and Treas., Howard D. Youmans; Supt., Jas. Middemist. Rept. by Secy., Oct. 2, '96. REFERENCE.—Eng. News, Feb. 11, '82. NOTE.—Press repts. state town took steps in '95 to build independent works and that in '96 people voted for same; also that in Jan., '97, Co. accepted offer from town of $40,000 for plant. Feb. 1, '97, H. S. Graham rept. that Co. had accepted offer and village expected to take possession of works at an early date.

84. **DEPEW and LANCASTER,** Erie Co. (Depew, not given; Lancaster, 1,692.) Built in '93 by Depew and Lancaster Water-Works Co. Nov. 10, '96, Frank S. Cushing, Vil. Clk. of Lancaster, rept. that extension to supply Lancaster would be completed Dec. 15, '96. SUPPLY.—Wells, pumping to tanks. PUMPS.—Cap., 5,750,000 galls.; two Snow, a 5,000,000 and a 750,000. Bituminous coal used; av. cost, $2 per short ton, delivered. TANKS.—Cap., 200,000 galls.; 2—100,000. DISTRIBUTION.—Mains, 9 miles. Taps, 234;

made by Co. for $2.10 per tap. Services paid for by owner. Meters, 13; owned by consumer; controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, 15. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 60 lbs.; fire, 80-100 lbs. FINANCIAL.—Cost, $173,000. Revenue: City, fire protection, $11,000. MANAGEMENT.—Prest., Henry Koons, 474 Main St., Buffalo; Vice-Prest., James A. Roberts, 404 Main St., Buffalo; Secy. and Treas., John L. Williams, 16 Seneca St., Buffalo; Supt., Frank A. Tenbrook. Rept. by Supt., June 10. SEWERS.—For household wastes.

85. **DEPOSIT,** Broome Co. (1,530.) Built in '85 by Deposit Water Co. FRANCHISE.—10 yrs. from '84. Rates are fixed in franchise and subject to regulation by city. City to pay $800 per yr. for public service of 40 hydrants for five years ending Oct. 1, 1900. SUPPLY.—Butler Brook, by gravity from storage and distributing reservoirs. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 6 miles; cost of extensions met by earnings. Taps, 150; made by Co. Services, lead and iron; paid for by Co. to curb. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 40; private, 4. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $32,000. Cap. Stock, Authorized, $25,000; all paid-up; paid 4% div'd in '95. Expenses, $2,974: Operating, $275; taxes, $256. Revenue, $3,065: Consumers, unmetered, $2,200; City, fire protection, $800; street sprinkling, $65. MANAGEMENT.—Prest., A. P. Minor; Secy., C. K. Brown; Treas., Jas. S. Minor; Supt., C. M. Putnam. Rept. by Secy., June, '96. SEWERS.—None.

D 7. **DE RUYTER,** Madison Co. (667.) Town voted Dec. '8, 96, to issue bonds for works. Jan. 8, '97, Comrs. voted to employ J. F. Witmer, Buffalo, as Engr. Rept. by A. W. Francis, Prest. Comrs.

221. **DOBB'S FERRY,** Westchester Co. (2,083.) See North Tarrytown.

86. **DOLGEVILLE,** Herkimer Co. (Est., 1,200.) Built in '94 by village. Put in operation Oct. 27, '94. Engr., Wm. H. Collins. Contrs., Smith Bros., Pelhamville. SUPPLY.—Stream, by gravity. Intake reservoir on stream, with minimum dry weather flow of 2,160,000 galls. in 24 hrs. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 11 miles. Taps, 167; made by consumer. Services, lead and iron; paid for by property owner. Meters: 2; owned and repaired by consumer; controlled by village. Use of meters compulsory for hotels. Town can compel use of meters and any consumer may have one. Hydrants, 54. PRESSURE.—Ordinary, 120 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $65,000. Debt, $70,000: Bonded, $50,000, at 3½%; due in 29 years; $20,000, at 4%; due in 5 to 20 years. Expenses, $3,400: Operating, $800; int., $2,600. Revenue, $3,924: Consumers, unmetered, $1,748; metered, $77; City, fire protection, $1,800; other purposes, $300. MANAGEMENT.—Prest., Alfred Dolge; Secy., W. F. Tanner; Treas., Calvin Brockett; Supt., N. A. Snell. Rept. by Supt., Sept. 3. SEWER.—None.

87. **DOWNSVILLE,** Delaware Co. (Est., 516.) Built in '95 by Downsville Water Co. Engr. and Contr., H. J. Williams. SUPPLY.—Springs, creek and impounding and storage reservoir (by gravity?). RESERVOIR.—Cap., 50,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by stock. Taps, 44; made by Co. for $5 to $10. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, 20. CONSUMPTION.—(Galls.) av., 2,200; min., 1,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $6,500. Cap. Stock: Authorized, $6,500; all paid-up; paid 3% div'd in '95. No debt. Expenses: Operating, $50; taxes, $40 to $55. Revenue: City, fire protection, $150; other purposes, $191. MANAGEMENT.—Prest., C. E. Hulbert; Secy., H. J. Williams; Treas., W. E. Holmes; Supt., Wm. Bresee. Rept. by Prest., Nov. 23.

88. **DRYDEN,** Tompkins Co. (668.) Built in '98 by village. Engr., S. L. Howe, McLean. Contr., Fred C. Reynolds. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 600,000 galls.; distributing. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, not given; cost extensions met by income. Services, galv. i.; paid for by consumer. Meters: 6; owned, controlled [illegible] repaired by village; yearly rental, $2 for ½-in., $3 for ¾-in. Have recently c[illegible] meters. Town can compel use of meters and any consumer may hav[illegible] 46. PRESSURE.—75 to 85 lbs. FINANCIAL.—Cost, $25,500. MANAG[illegible]., Geo. E. Monroe; Secy. and Treas., J. H. Kennedy. Rept. by Secy., June 19. SE[illegible]RS.—None.

89. **DUNKIRK,** Chautauqua Co. (9,413.) Built in '71 by village. SUPPLY.—Lake Erie, pumping direct; 24-in. pipe one mile long to pump well. PUMPS.—Cap., 8,500,000 galls. Snow, 5,000,000; Holly, quadruplex, 2,000,000; Worthington, 1,500,000, comp. cond. Dagus slack coal used; av. cost, $1.57 per short ton, delivered. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 28 miles; cost extensions met by taxation. Taps, 1,800; made by consumer. Services, lead or galv. i.; paid for by consumer. Meters: 7; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 116; private, 12. CONSUMPTION.—(Galls.) av., 3,500,000. PRESSURE.—Ordinary, 60 lbs.; fire, 135 lbs. FINANCIAL.—Cost (in '90), $152,849. Bonded debt, $147,600. Expenses, $12,957: Operating, $11,366; int., $8,591. Revenue: Consumers, $14,773; "water taxes," $16,587. MANAGEMENT.—Prest., R. L. Cary; Secy., John Madigan; Treas., A. J. Lunt; Supt., L. E. Thompson. Rept. by Supt., June 11. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Oct. 28, '82.

90. **EARLVILLE,** Madison Co. (536.) Built in '94 by village. Engr., John A. Clark, Jr., Sidney. (Rept. by E. D. Smalley, Syracuse, states that he was Engr.) Contrs., Flood & Sherrill, Sandy Hill. SUPPLY.—Impounding reservoir fed by brooks and springs (by gravity ?). DISTRIBUTION.—Mains, 5 miles. Taps, 150. Services, galv. i.; paid for by consumers. Meters, 0. Hydrants, 35. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $27,000. Bonded debt, $26,000, at 4%; due in 1914; $1,000, at 4%; due in 1899. Expenses: Int., $1,080. Revenue, $1,900: Consumers, unmetered, $1,600; City, fire protection, $300. MANAGEMENT.—Prest., E. C. Bentley; Secy., L. S. Arnold; Treas., Guy H. Clark; Supt., E. G. Worden. Rept. by Treas., June 10. SEWERS.—None.

182. **EAST ALBANY,** Rensselaer Co. See Greenbush.

91. **EAST AURORA,** Erie Co. (1,582.) Built in '89-90 by town. SUPPLY.—Springs, by direct pumping. Press rept., July, '96, stated 8 wells had just been completed and pump added. PUMP.—Cap., 700,000 galls.; Holly hor. water power. DISTRIBUTION.—Mains, 4 miles. Hydrants, 50. FINANCIAL.—Contract price, $34,996. NOTE.—No official rept. since '90-1 Manual.

28. **EAST ISLIP,** Suffolk Co. See Bay Shore.

92. **EAST RANDOLPH,** Cattaraugus Co. (Est., 1,000.) Built in '89 by village. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap. 315,000 galls., for fire protection. DISTRIBUTION.—Mains, 4 miles; cost extensions met by revenue. Taps, 115; made by consumer. Services, paid for by consumer. Meters, 0. Hydrants, 16. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—(In '90) Cost, $11,500. Bonded debt, $14,000, at 4%. MANAGEMENT.—Prest., Saml. J. Benedict; Secy. and Supt., B. R. Johnson; Treas., C. D. Tuttle; Village Clerk, Henry C. Seil. Rept. by Village Clk., Oct. 14. SEWERS.—Has storm sewers only.

93. **EAST SYRACUSE,** Onondaga Co. (2,231.) Built in '93 by village. Engr., W. F. Randall, Syracuse. Contrs., P. H. Harrison & Son, Newark, N. J. SUPPLY.—Springs (by gravity ?). RESERVOIRS.—Cap., 5,000,000 galls.; distributing. FISCAL YEAR CLOSED Mar. DISTRIBUTION.—Mains, 14 miles; cost extensions met by income. Taps, 220; made by village at rates of $6 for ½-in. and $7.50 for ¾-in. taps. Services, galv. i.; paid for by property owner. Meters: 14; owned and controlled by village; yearly rental, 10%. Use of meters compulsory for manufacturing establishments and hotels. Village can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 4. PRESSURE.—Ordinary, 86 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $79,453. Bonded debt, $75,000, at 4%; due in 1913. Expenses, $3,387: Operating, $387; int., $3,000. Revenue: Consumers, unmetered, $1,428. Deficits met by a general tax. MANAGEMENT.—Prest., Geo. M. Weaver; Secy., H. E. Richardson; Treas., Chas. C. Bagg; Supt., J. B. Snook. Rept. by Prest., June 10. SEWERS.—None.

299. **EDGEWATER,** Richmond Co. (14,265.) See Stapleton.

94. **EDMESTON,** Otsego Co. (1,703, town.) Built in '96 by Edmeston Water-Works Co.; put in operation Oct. 1. Engr., Homer Underwood. City to pay for public service. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 800,000 galls.; storage. DISTRIBUTION.—Mains, 2 miles. Taps, 1; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, 20. PRESSURE.—Ordinary, 105 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Authorized, $20,000. Bonded debt, $12,000, at 5%; due 1916. Expenses: Int., $600. Revenue: Consumers, $500; City, fire protection, $400. MANAGEMENT.—Prest., A. C. Morehouse; Secy., A. A. Pope; Treas., A. P. Underwood. Rept. by Secy. SEWERS.—None.

95. **EDWARDS,** Saint Lawrence Co. (1,267, town.) Built in '95 by village; put in operation June 4. Contr., A. R. Shannon, Watertown. SUPPLY.—Oswegatchie River, pumping to stand-pipe. PUMP.—Wind engine. STAND-PIPE.—Cap., 14,430 galls.; steel, 17 × 35 ft., on stone foundation. FISCAL YEAR CLOSED Mar. 16. DISTRIBUTION.—Mains, 1 mile; cost extensions met by taxation. Taps, 35; made by consumer. Services, galv. i. or lead; paid for by property owner. Meters, 0. Hydrants, 8. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $4,486. Bonded debt, $4,500, at 4%; due 1914. No sinking fund. Expenses: Int., $180. Revenue: Consumers, $69. MANAGEMENT.—Prest., Wm. Gardner; Secy., M. B. Clark; Treas., William S. Woodcock. Rept. by E. Bancroft, Town Clerk, Oct. 31. SEWERS.—Has storm sewers only.

96. **ELIZABETHTOWN,** Essex Co. (575.) Built in '83 by Elizabethtown Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, by gravity. RESERVOIR.—Storage. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by receipts. Taps, 80; made by Co. Services, iron; paid for by property owner. Meters, 0. Hydrants, 17. PRESSURE.—Ordinary (in '89), 100 lbs. FINANCIAL.—Cost, $18,500. Cap. Stock: Authorized, $8,000; all paid-up. Bonded debt, $7,000, at 6%. No sinking fund. Expenses: Int., $450; taxes, $40. MANAGEMENT.—Prest., Richard S. Hand; Secy., Treas. and Supt., R. C. Kellogg. Rept. by Supt., July 18.

97. **ELLENVILLE,** Ulster Co. (2,881.) Built in '71 by village. SUPPLY.—Mountain brook, by gravity. RESERVOIRS.—Cap., 185,000 galls.; 175,000 and 10,000 resp. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions

met by rentals. Taps, 350; made by village. Services, galv. i.; paid for by village. Hydrants, public, 62; private, 2. Several meters are at present set for testing. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Bonded debt, $13,500, at 3%. Expenses, $1472: Operating, $1,000; int., $472. Revenue: Consumers, $2,830. MANAGEMENT.—Comrs. Chn., Dwight Divine; Secy., Clark Eaton; Clk. of Comrs., John A. Tice; Supt., D. S. Williams. Rept. by Clk., July 10. SEWERS.—None. REFERENCE.—Eng. News, Feb. 3, '83.

98. **ELLICOTTVILLE,** Cattaraugus Co. (852.) Built in '90 by Ellicottville Water Co.; put in operation Dec. 1. FRANCHISE.—City to pay $35 per hydrant per yr.; contract of five years. SUPPLY.—Springs, by pumping. PUMPS.—Snow. Bituminous coal used; av. cost, $2.40 per short ton. RESERVOIR.—Cap., 200,000 galls.; storage. DISTRIBUTION.—Taps, 100; made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 15; private, 1. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $16,500. Cap. Stock, Authorized, $10,000. No debt. Expenses: Operating, $300. MANAGEMENT.—Prest., C. Perry Vedder; Secy., J. O. Clark; Treas., C. A. Case; Supt. and Ch. Pump Engr., L. B. Nichols. Rept. by Supt., June 6. SEWERS.—Has sanitary and storm sewers.

99, 100. **ELMIRA,** Chemung Co. (30,893.)

ELMIRA MUNICIPAL IMPROVEMENT CO.

Built in '60-1 by Elmira Water-Works Co. Now owned by the Elmira Municipal Improvement Co. FRANCHISE.—Perpetual from '69; provides for purchase of works by city at any time. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $13,000 per year for an unlimited number of hydrants. City supplies hydrants, Co. sets same and the rate includes supply for city public buildings and flushing of sewers. SUPPLY.—Chemung River, pumping to reservoir and Carr's Creek, from impounding reservoir. PUMPS.—Cap., 9,000,000 galls. Knowles, 3,000,000; Worthington hor. comp. high duty, 6,000,000. Eureka Clearfield bituminous mine run coal used; av. cost, $1.95 per short ton, f. o. b. FILTERS.—Cap., 6,000,000 galls.; Jewell, to be in operation Feb. 1, '97. RESERVOIRS.—Cap., 117,500,000 galls. Impounding, 113,000,000; area, 26 acres; 210 ft. above city. Distributing, 4,500,000; 90 ft. above pumps. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 44 miles; cost extensions met by income or bonds. Taps, 3,000; made by Co., free. Services, galv. i.; paid for by owner. Meters, 420; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for manufacturers, tenements and livery stables. Meters are in use on nearly all services except private residences; Co. refuses to meter private services until they are able to meter all. Hydrants, public, 340; private, 3. CONSUMPTION.—(Galls.) av., 3,000,000; max., 3,700,000. PRESSURE.—Ordinary, 44 lbs. Steam fire engines are used. FINANCIAL.—Cost, $675,000. Cap. Stock, Authorized, $1,000,000; paid-up, $200,000; paid 12½% div'd in '96; no dividends in the two preceding years. Bonded debt, $354,000, at 6%, due in 1921. Expenses, $43,604: Operating, $17,000; int., $21,240; taxes, $5,364. Revenue, $67,995: Consumers, unmetered, $39,078; metered, $13,891; City, fire protection, $13,000; street sprinkling, $2,027. MANAGEMENT.—Prest., Geo. W. Young, 69 Cedar St., N. Y. City; Secy., Treas. and Supt., J. M. Diven; Ch. Pump. Engr., J. J. Kingsbury. Rept. by Supt., June 8. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, July 8, '82.

ELMIRA HEIGHTS WATER CO.

Under construction in '96 by Elmira Heights Water Co.; will probably begin service Jan. 1, '97. Engr., Wm. W. Cole. Contrs., Clinton, Beckwith & Co., Herkimer. FRANCHISE.—99 yrs. from '96. SUPPLY.—Six 6-in. wells, 110 ft. deep, pumping to reservoir. PUMPS.—Cap., 2,600,000 galls.; 1—1,000,000 Worthington and 1—1,600,000 Knowles. Run of mine coal to be used; av. cost, $1.85 per short ton. RESERVOIRS.—Cap., 2,500,000 galls. Distributing, elev. 250 ft. above town. DISTRIBUTION.—Mains, 7½ miles. Services, galv. i.; paid for by property owner. Use of meters optional with Co. Hydrants, public, 82; private, 9. PRESSURE.—Ordinary, 100 lbs.; fire, 120 lbs. FINANCIAL.—Cost, undetermined. Cap. Stock, authorized, $40,000. MANAGEMENT.—Prest., Jas. B. Rathbone; Secy. and Supt., Wm. W. Cole; Treas., H. H. Hollock; Ch. Pump. Engr., Phil. Kanfelt. Rept. by Supt., Dec. 8. SEWERS.—None.

101. **FAIRPORT,** Monroe Co. (2,552.) Built in '92 by village. Engr., F. S. Randall, Syracuse; Contrs., Continental Constn. Co., New York. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Knowles. (A 500,000 Holly hor. dup. rept by maker.) Bituminous coal used; av. cost, $2.50 per short ton. STAND-PIPE.—Cap., 300,000 galls.; 26 x 75 ft., on masonry foundation. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by income and assessments. Taps, 175; made by city; free. Services, galv. i.; paid for by property owner. Meters, 50; owned, controlled and repaired by consumer; yearly rental, $4.00. Use of meters compulsory for manufacturers. Village can compel use of meters and consumers may not have them. Hydrants, public, 68; private, 1.—CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary, 50-90 lbs. FINANCIAL.—Cost, $48,000. Bonded debt, $43,000, at 3½%; due in 30 years; no sinking fund. MANAGEMENT.—Prest., C. L. Peacock; Secy. and Treas., F. A. Defendorf; Ch. Pump. Engr., Robt. Ewing. Rept. by Prest., June 11. SEWERS.—Has sanitary and storm sewers.

102. **FALCONER,** Chautauqua Co. (574.) Built in '93 by American Water-Works & Guarantee Co. Engr., Jas. A. Morrow. FRANCHISE.—10 yrs. from '93. Does not provide for purchase of works by city. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant service. SUPPLY.—From Jamestown plant. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by Co. Taps, 75; made by Co., free of charge. Services, galv. i.; paid for by Co. Meters: 5; owned, controlled and repaired by Co. Use of meters compulsory for manufactories. Co. cannot compel use of meters, but any consumer may have one. Hydrants, 10. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. MANAGEMENT.—Prest., W. S. Kuhn, Pittsburg; Secy., J. H. Purdy. Rept. by Supt., D. W. Immel. SEWERS.—None.

103. **FAR ROCKAWAY,** Queens Co. (2,288.) Built in '84 by Queens County Water Co. Supplies Arverne, Rockaway Beach, Rockaway Park, Lawrence and Inwood. Des. and Const. Engr. for work done since '90, Chas. B. Brush; Contr., Miles Tierney. FRANCHISE.—Rates are fixed by contract. Co. is not exempt from local taxes. City to pay for fire hydrants only at $20 each per annum. SUPPLY.—Deep wells and brooks, pumping to stand-pipes. PUMPS.—Cap., 9,750,000 galls.; 2—2,000,000 Worthington comp., working against 250 ft. head; one 4,000,000 Worthington comp., against 40 ft. head; one 1,000,000 Davidson comp., head of 250 ft.; one 750,000 Davidson high pressure, head 150 ft. Pea coal is used; av. cost, $3.25 per short ton. FILTER BEDS.—Cap., min., 4,000,000 galls.; area, 40,000 sq. ft.; 4½ ft. deep. STAND-PIPES.—Cap., 328,000 galls. Two, wrought iron; one at Far Rockaway, 20 × 100 ft., 235,000; one at Far Rockaway Park, 12 × 110 ft., 93,000. FISCAL YEAR CLOSED June 1, '96; report is for year ending Dec. 1, '96, as plant has been enlarged during past summer. DISTRIBUTION.—Mains, 46 miles; cost extensions met by bonds or sale of stock; revenue is guaranteed by abutting property owners. Taps, 1,430; made by Co. for $2.50 and up. Services paid for by consumer. Meters: 300; owned, controlled and repairs paid for by Co., "except in case of freezing or other misuse." Use of meters compulsory for all large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 252. CONSUMPTION.—(Galls.) av., 929,000; max., 2,060,000; min., 400,000. Population supplied ranges from about 5,000 in winter to about 30,000 as an extreme during summer. PRESSURE.—Ordinary, 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $763,000. Cap. Stock, Common, authorized, $500,000; all paid-up. Bonded debt, $249,000, at 5%; installments due yearly in Feb. and Sept. Expenses, Operating, $19,100; int., $12,450. Revenue, $40,000: Consumers, unmetered, $18,000; metered, $17,000; City, fire protection, $5,000. MANAGEMENT.—Prest., Franklin B. Lord, 120 Broadway, New York; Secy. and Treas., G. S. Buck, 55 Liberty St., New York; Engr. in charge, Chas. R. Bettes; Ch. Engr., Chas. B. Brush, Hoboken, N. J. Rept. by Ch. Engr., Dec. 31, '96. SEWERS.—No complete sewerage system; one under construction.

104. **FAYETTEVILLE,** Onondaga Co. (1,410.) Built in '92 by village. Put in operation Jan. 1, '93. Engr., E. D. Smalley. Contr., Col. M. B. Birdseye. SUPPLY.—Natural springs, by gravity. RESERVOIR.—Cap., 1,000,000 galls.; storage, 235 ft. above village. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by issuing notes. Taps, 124; made by village. Services, galv. i. Meters: 2; owned by village; yearly rental, 10% of cost. Use of meters compulsory for mills. Village can compel use of meters and consumers may have them, but must pay not less than $10 per annum. Hydrants, 42. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $31,500. Bonded debt, $29,000, at 3½%; due 1912; $300, at 5%; due 1897; $15,000, at 4%; due 1897; and $600, at 6%; due 1897. Revenue, $1,100. Deficits, $700 to $1,000 per annum taxes for deficits. MANAGEMENT. — Prest., Platt H. Smith; Secy., W. T. Gayner; Treas. and Supt., D. P. Babcock. Rept. by Prest., Aug. 17. SEWERS.—None.

105. **FISHKILL-ON-THE-HUDSON AND MATTEAWAN,** Dutchess Co. (Fishkill-on-the-Hudson, 3,617; Matteawan, 4,278.) Built in '86-7 by Fishkill & Matteawan Water Co. FRANCHISE.—20 yrs. Co. is not exempt from local taxes. City to pay $45 per hydrant per yr. SUPPLY.—Mountain stream, by gravity from impounding reservoirs. RESERVOIRS.—Cap., 118,000,000 galls. Beacon, 1,200 ft. above Hudson River, 100,000,000. Milzirgat, No. 1, 800 ft. above river, 8,000,000; and Milzirgat, No. 2, 10,000,000. DISTRIBUTION.—Mains, 12 miles. Taps, 600; made by Co., free. Services, paid for by property owner. Meters: 25; controlled by Co. Use of meters not optional with consumer; compulsory for hotels and factories. Hydrants, 85. PRESSURE.—Ordinary, 95 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., G. E. Taintor; Secy. and Treas., G. D. L. Huilier; both 11 Wall St., N. Y. City; Supt., E. H. Sheaff. Rept. by Supt., July 10. SEWERS.—None.

39. **FLATBUSH,** Kings Co. See Brooklyn.

106. **FLORIDA,** Orange Co. (Est., 600.) Built in '92 by Florida Water-Works Co. Engr. and Contr., J. B. Rider, South Norwalk, Conn. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay by yearly contract for public service. SUPPLY.—Glenmere Lake (640 acres), by gravity. Intake, 540 ft. 10-in. pipe. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income. Taps, 63; made by city, free. Services, lead and iron; paid for by consumers. Meters, 0. Hydrants, 20. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $24,000. Cap. Stock, $20,000: Common, authorized, $10,000. Floating debt, $2,000, at 5%; Bonded, $10,000, at 6%; due in 1902, 1907 and 1912. Expenses: Operating, nominal. Revenue, $800: Consumers, $400; City, fire protection, $400. MANAGEMENT.—Prest.

and Treas., Wm. E. Sturr; Secy. L. D. Adams; Supt., Saml. Green. Rept. by Supt., June 11. SEWERS.—None.

107. **FLUSHING,** Queens Co. (8,468.) Built in '74 by village. SUPPLY.—Driven wells and large pond, latter used only for fire purposes, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000; Holly quadruplex and Blake. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 25 miles. Taps, 1,297. Services, lead and galv. 1. Meters, 675. Hydrants, 164. CONSUMPTION.—(Galls.) av., 512,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $226,976. Total debt, $223,302: Floating, $3,226; Bonded, $219,976; $150,000, at 7%; $43,000, at 5%; $26,976, at 6%. Expenses, $18,509. Revenue, $21,241: Consumers, $18,216; City, $3,025. MANAGEMENT.—Water Comrs.; Supt., G. A. Rouillier. PROJECTED IMPROVEMENTS.—Stand-pipe and new pumping engine. SEWERS.—Has sewers. NOTE.—No official rept. since '90-1 Manual.

108. **FONDA,** Montgomery Co. (1,190.) Built in '85 by village. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 2,000,000 galls.; storage. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 1½ miles. Taps, 160; made by village, free. Services, lead; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, 35. CONSUMPTION, unknown. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $28,000. Floating debt, $8,000, at 5%. Expenses: Operating, $400. MANAGEMENT.—Prest., F. N. Sanderson; Secy., E. J. Vrooman; Treas., W. A. Smith; Supt., Henry Siver. Rept. by Supt., June 8. SEWERS.—Has sanitary and storm sewers.

109. **FORESTVILLE,** Chautauqua Co. (Est., 788.) Built in '95 by village. Engr., W. J. White, Buffalo. Contr., W. B. Wilson, Buffalo. SUPPLY.—Springs (by gravity?). RESERVOIR.—Storage. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2¾ miles. Taps, 78; made by consumer for 50 cts. per tap. Services, ½-in. galv.; paid for by owners. Meters: Village can compel use of meters and any consumer may have one. Hydrants, 27. PRESSURE.—Ordinary, 108 lbs. FINANCIAL.—Cost, $20,970. Floating debt, $970; Bonded, $20,000. Revenue, $103: Consumers, $78; street sprinkling, $25. Deficits are paid by a tax on non-users. MANAGEMENT.—Prest., S. W. Reynolds; Secy., W. H. Parsons. Rept. by Chas. L. Dix, June 10. SEWERS.—None.

110. **FORT EDWARD,** Washington Co. (4,424, town.) Village works built in '94; put in operation Mar. Engr., S. E. Babcock, Little Falls. Contrs., Hallman Bros. & Fenton. Old works for domestic supply only built in '55 by Geo. Taylor. SUPPLY.—Springs and streams, by gravity. RESERVOIR.—Cap., 11,000,000 galls.; storage and distributing, located on stream, 1¾ miles from village. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by revenue. Taps, 333; made by consumer for 50 cts. Services, galv. 1. or lead; paid for by consumer. Meters, 0. Village can compel the use of meters and any consumer may have one. Hydrants, 50. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary and fire, 67 lbs. One steam fire engine is used. FINANCIAL.—Cost, $100,000. Bonded debt, $100,000, at 4%; due 1914. Expenses, $3,950: Operating, $150; int., $3,800. Revenue, $5,425. Consumers, $2,400; street sprinkling, $25; other purposes, $3,000. MANAGEMENT.—Prest., J. J. Morgan; Secy., Francis B. Davis; Treas., J. W. Milliman; Supt., J. Langham. Rept. by Secy., Nov. 12. SEWERS.—Has sanitary and storm sewers.

87. **FORT HAMILTON,** Kings Co. See Brooklyn.

111, 112. **FORT PLAIN,** Montgomery Co. (2,864.)

FORT PLAIN WATER-WORKS CO.

Built in '85. FRANCHISE.—Provides for purchase of works by city at the end of every 5 yrs. Rates neither fixed in franchise nor subject to regulation by city. LEGAL DIFFICULTIES.—Co. failed to prevent town from building municipal works in '95. Later in year works were sold at auction and bought in by bondholders. SUPPLY.—Springs, by gravity; filtered. RESERVOIRS.—Cap., 15,000,000 galls. FISCAL YEAR CLOSED March 26. DISTRIBUTION.—Mains, 9 miles. Taps, 165. Meters, 1. Hydrants, 52. PRESSURE.—Ordinary, 79 lbs. FINANCIAL.—Plant sold by auction to the bondholders in '95. NOTE.—No official rept. since '90-1 Manual.

VILLAGE WORKS.

Put in operation in Dec., '95. Engr., Boyd Ehle. SUPPLY.—Gravity, from source seven miles distant. (A 500,000-gall. Deane dup. pump rept. by makers as sold for use here in '95.) RESERVOIR.—Storage. DISTRIBUTION.—Hydrants, 66. FINANCIAL.—Withheld. MANAGEMENT.—Water Comrs. Rept. by A. Dunn, Nov. 10. SEWERS.—Has sanitary and storm sewers.

113. **FRANKFORT,** Herkimer Co. (2,291.) Built in '94 by village. Engrs., Stanwix Eng. Co., Rome. Contr., M. B. Birdseye, Fayetteville. SUPPLY.—Springs (by gravity?) RESERVOIRS.—Cap., 9,000,000 galls.; storage, 1½ miles from center of city. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 7 miles. Taps, 330; made by village. Services, lead or iron; paid for by village to curb. Meters, 22; owned and repaired by consumer; controlled by village. Village can compel use of meters and consumers may have them. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 130,000. PRESSURE.—Ordinary, 85-95 lbs. One steam fire engine is kept in reserve. FINANCIAL.—Cost, $50,000. Bonded debt, $50,000, at 3½%, due in 28 years. Expenses, $2,850: Operating,

$1,000; int., $1,750. MANAGEMENT.—Prest., Geo. A. Smith; Secy., Wm. Wayne; Treas., T. R. Farrell; Supt., Thos. Honohan. Rept. by Supt., June 20. SEWERS.—None. REFERENCE.—Aerating fountain, Eng. News, June 7, '94.

114. **FRANKLIN,** Delaware Co. (581.) Built in '89-90 by village; put in operation in Feb., '90; changed to gravity system June, '94. Engr., E. F. Musson, Norwich. Contrs., W. J. O'Conner & Co., Syracuse. SUPPLY.—Springs, by gravity; water collected in catch-basin and passes through 4-in. pipe to reservoir. RESERVOIR.—Cap., 225,000 galls.; storage and distributing, 200 ft. above village. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 2 miles; cost of extensions met by tax; bonds if over $500. Taps, 87; made by consumer. Services, galv. i.; paid for by consumer. Meters, 24; owned and repaired by consumer; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, 19. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $23,500. Bonded debt, $19,000, at 3½%; $4,500, at 5%, due $500 yearly. Sinking Fund, $500. Expenses: Int., $890. Revenue: Consumers, $791. Deficits are all met by taxation. MANAGEMENT.—Prest., Simon P. Smith; Secy., Geo. F. Sullord; Treas., Chas. A. Bennett. SEWERS.—None.

115. **FRANKLINVILLE,** Cattaraugus Co. (1,021.) Built by village; put in operation Jan. 1, '91. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 750,000 galls. DISTRIBUTION.—Mains, 10 miles. Hydrants, 35. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $33,000. Bonded debt, $32,000, at 4%. MANAGEMENT.—Comrs. Prest., H. C. Forwell; Secy., Geo. H. Chandler; Treas., A. O. Holmes; Village Clk., Chas. T. Mason. Rept. by Clk., Oct. 3.

116. **FREDONIA,** Chautauqua Co. (3,399.) Built in '84 by city. SUPPLY.—Creek, by gravity from impounding reservoir. RESERVOIR.—Cap., 9,000,000 galls.; 3 miles from, 240 ft. above village. In '96 new 90,000,000-gall. reservoir was put under construction. Press rept. at close of year stated that reservoir was nearly finished, but that embankment was sliding. DISTRIBUTION.—Mains, 9 miles. Taps, 419. Meters, 7. Hydrants, 56. PRESSURE.—Ordinary, 105 lbs. FINANCIAL.—Cost, $90,000. Bonded debt, $84,000, at 4%. Expenses, $3,605: Operating, $245; int., $3,360. Revenue, $4,000. MANAGEMENT.—Comrs. NOTE.—No report since '88-9 Manual. REFERENCE.—Eng. News, Sept. 20, '84.

117. **FREEPORT,** Queens Co. (Est., 1,328.) Built in '94 by village. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Worthington simple high pressure. FINANCIAL.—Contract price, $34,400. MANAGEMENT.—Comrs. NOTE.—Information from press repts., except regarding pumps.

118. **FRIENDSHIP,** Allegany Co. (1,369.) Built in '96 by Friendship Water Co. Engr., E. D. Smalley, Syracuse. Contr., O'Connor & Mackaye, Syracuse. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. City to pay (probably) $1,200 per yr. for 50 hydrants. Co. to install and maintain two public drinking fountains. SUPPLY.—Springs, 2½ miles from city, by gravity. RESERVOIRS.—Cap., 600,000 galls.; storage and distributing. DISTRIBUTION.—Mains, 9 miles. Taps, 130; made by Co. at actual cost. Services, not given; paid for by consumer. Meters, 130; owned and controlled by Co.; repairs made by Co., charged consumer at cost. Use of meters compulsory for all consumers. Hydrants, 50. CONSUMPTION.—(Galls.) av., 25,000, est. PRESSURE.—Ordinary and fire, 90 lbs. City owns one steam fire engine. FINANCIAL.—Cost, $25,000. Cap. Stock: Common, authorized, $20,000; all paid-up. Expenses: Operating, $400, est.; taxes, $200, est. Revenue: Consumers, metered $1,000, est.; City, fire protection, $1,200, est. MANAGEMENT.—Prest., A. Miner Wellman; Secy. and Treas., B. J. Rice. Rept. by Prest., June 12. SEWERS.—None.

119. **FULTON,** Oswego Co. (4,214.) Built in '85 by Fulton Water-Works Co. Supplies Oswego Falls. FRANCHISE.—Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay for hydrant rental. SUPPLY.—Spring, pumping to standpipe. PUMPS.—Cap., 3,000,000 galls.; Knowles and Worthington comp. cond., 1,500,000 each. Bituminous coal used; av. cost, $3.25 per short ton. STAND-PIPE.—Cap., 188,000 galls.; iron, 20 × 80 ft. DISTRIBUTION.—Hydrants, 116. CONSUMPTION.—(Galls.) av., 550,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are rarely used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., H. E. Nichols; Secy. and Treas., F. A. Emerick; Supt., R. E. Phillips; Ch. Pump. Engr., Martin Dieterich. Rept. by Secy., July 30.

120. **FULTONVILLE,** Montgomery Co. (1,122.) Built in '75 by J. H. Starin. SUPPLY.—Springs, by gravity to small reservoirs, thence by pumping to large reservoirs. PUMPS.—Cap., 30,000 galls.; Seneca Falls. RESERVOIRS.—Cap., 165,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 2 miles. Taps, 80. Hydrants, 12. FINANCIAL.—Cost, $20,000. Expenses, Operating, $50. Revenue, $300. MANAGEMENT.—Owner, J. H. Starin. NOTE.—No report since '90-91 Manual.

121. **GARDEN CITY,** Queens Co. (1,000, est.) Built in '76; owned by A. T. Stewart's estate. SUPPLY.—Well, pumping direct. Well, 50 × 35 ft. PUMPS.—Cap., 1,500,000 galls.; Holly quadruplex. DISTRIBUTION.—Mains, 11 miles. Taps, 100. Meters, 0. Hydrants, 35. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 60 to 160 lbs. FINANCIAL.—Withheld. MANAGEMENT.—L. H. Cunliff, Agt. Rept. by Supt., Sept. 30. REFERENCE.—Eng. News, Mar. 3, '83.

122. **GENESEO,** Livingston Co. (2,286.) Built in '87 by village. SUPPLY.—Conesus Lake, pumping to reservoir. Lake is 5 miles from village, ⅝ miles wide, 9 miles long. PUMPS.—Cap., 600,000 galls.; Holly hor. dup. Shawmut coal used; av. cost, $3 per short ton, delivered. RESERVOIR.—Cap., 1,500,000 galls.; storage and distributing, 200 ft. head. FISCAL YEAR CLOSED Dec. 4, '95. DISTRIBUTION.—Mains, 12 miles; cost extensions met by income. Taps, 316; made by village for $2. Services, iron; paid for by owner of property. Meters, 8; owned by consumer; controlled and repaired by village. Use of meters compulsory for engines, factories and large private houses. Village can compel use of meters and any consumer may have one. Hydrants, public, 77; private, 8. CONSUMPTION.—(Galls.) av., 164,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $80,000. Bonded debt, $25,000 at 3½%, due '97; $25,000, at 3½%, due 1917; $20,000, at 3½%, due 1907. Sinking Fund, $14,500, invested at 6%. Expenses, $5,892: Operating, $3,200; int., $2,450. Revenue $7,017: Consumers, $4,441. The sum of $2,000 is raised yearly by direct tax for sinking fund for payment of bonds. MANAGEMENT.—Prest., W. A. Wadsworth; Secy. and Treas., T. F. Olmsted; Supt., Geo. R. Meeker; Ch. Pump. Engr., Geo. Whitney. Rept. by Supt., June 6. PROJECTED IMPROVEMENTS.—New boiler and pump. SEWERS.—Has combined sanitary and storm sewers.

123. **GENEVA,** Ontario Co. (7,557.) Bought by town latter part '96. Built in 1787 by Geneva Water-Works Co. SUPPLY.—Springs, 200 ft. above lake, by gravity; also Seneca Lake, pumping to reservoir. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. Westmoreland coal used; av. cost, $2.75 per short ton. RESERVOIRS.—Three impounding; water pumped from lake when supply furnished by springs is insufficient. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 24 miles; cost extensions met by Co., and for each 500 ft. of main added city is entitled to one fire hydrant, free. Taps, 900; made by consumer, permit $1. Services, w. i.; paid for by consumer. Meters, 100; owned, controlled and repaired by Co. Use of meters compulsory for those consumers where quantity used is uncertain. Co. can compel use of meters and any consumer may have one. Hydrants, public, 125; private, 4. CONSUMPTION, unknown. PRESSURE.—Ordinary, 35-100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $185,000. Cap. Stock: Authorized, $20,000; all paid-up. Bonded debt, $150,000, at 6%. MANAGEMENT.—Prest., S. H. Hammond; Secy., Thos. H. Chew; Treas., Alex. S. Chew; Supt., Sam'l S. Graves; Ch. Pump. Engr., Andrew J. Smith. Rept. by Supt., June 4. SEWERS.—Projected. REFERENCE.—Eng. News, Apr. 15, '82. NOTE.—Rept. was made before purchase of works by village. Press rept. states Edw. Seybolt was appointed Supt. by Comrs. in Nov., '96; also that village paid $150,000 for works.

124. **GILBERTSVILLE,** Otsego Co. (est., 708.) Built in '96 by village; put in operation Sept. 15. Engr., E. F. Musson, Norwich; Contr., L. J. Richardson, Owego. SUPPLY.—Mountain stream, flowing to collecting basin, thence by gravity to and from reservoir. RESERVOIR.—Cap., 150,000 galls.; storage, covered. DISTRIBUTION.—Mains, 2 miles. Taps, made by village. Services, paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, 28. CONSUMPTION, unknown. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, about $14,000. Bonded debt, $14,000, at 3½%, due in 1925. Expenses, Int., $490. Deficits are met by general taxation. MANAGEMENT.—Water Comrs. Prest., W. W. Stockwell; Secy., Wm. M. Deits; Treas., Ira L. Ward. Rept. by Secy., Nov. 30. SEWERS.—None.

125. **GLEN COVE,** Queens Co. (est., 3,750.) Built in '91; owned by estate of Chas. Pratt. Engr., H. J. Heath & D. M. Munger. No compensation as yet from town for public service. SUPPLY.—Three driven wells, pumping to tank. PUMPS.—Cap., 2,700,000 galls.; Worthington, 350,000 simple high pressure, 2,000,000 comp. cond.; Blake, 350,000 direct acting. Wood used at present. TANK.—Cap., 158,000 galls.; iron, 30 × 30 ft., on high hill. DISTRIBUTION.—Mains, 5 miles; cost extensions made by appropriations. Taps, 28; made by Co. Meters, 16; owned and repairs paid by consumer; controlled by Co. Use of meters compulsory for large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 5; private, 4. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 30 to 60 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Trustee, Chas. M. Pratt, 26 Broadway, New York; Supt., D. M. Munger; Ch. Pump. Engr., John Henderson. Rept. by Supt., Dec. 18. SEWERS.—None.

126. **GLENS FALLS,** Warren Co. (9,509.) Built in '72 by village. SUPPLY.—Mountain springs and brooks, by gravity from reservoirs. RESERVOIRS.—Two storage and two distributing, five miles from village. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 30 miles; cost extension met by taxation. Taps, 2,000; made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, 150. CONSUMPTION, unknown. PRESSURE.—Ordinary (in '89), 90 lbs. One steam fire engine is used. FINANCIAL.—Cost, $250,000. Bonded debt, $90,000, at 4%; $80,000, at 4%; $20,000, at 3%. Expenses: Operating, $2,000. Revenue: Consumers, $17,000. MANAGEMENT.—Prest. of Village, L. S. Ames; Trustee, J. B. Keeffe; Treas., J. O'Leary. Rept. by C. F. King, Sept. 29. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 17, '88.

127. **GLOVERSVILLE,** Fulton Co. (13,864.) Built in '78 by city. Enlarged in '92. Des. Engr., J. B. Tuckerman; Const. Engr., F. W. Brown; Contr., S. C. Ferguson. SUPPLY.—Springs and mountain streams, by gravity. RESERVOIRS.—Cap., 18,700,000 galls. Poor House, elev. 280 ft., 3,000,000; Middle, elev. 281 ft., 500,000; Bleecker, elev. 288

ft., 1,500,000; Potter, elev. 177 ft., 10,000,000; Rice Creek, elev. 245 ft., 3,000,000; Beach Creek, elev. 245 ft., 200,000, and Dixon Creek, elev. 245 ft., 500,000. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 22 miles; cost extensions met by income. Taps, 2,487; made by city for $7 for ½-in. and $9 for ¾-in.; larger sizes at actual cost. Services, galv. i.; paid for by consumer. Meters, 80; owned, controlled and repaired by city. Use of meters compulsory for mills. City can compel use of meters and any consumer may have one. Hydrants, public, 202; private, 6. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary (in '89), 120 lbs. FINANCIAL.—Cost, $298,192. Bonded debt, $70,000, at 6% (due '97, $24,000; 1902, $28,000; 1907, $23,000); $17,500, at 5%, due 1910; $55,000, at 3%, due 1909; $50,000, at 3½%, due 1917. Expenses, $11,230: Operating, $2,740; int., $8,490. Revenue: Consumers, unmetered, $26,995. MANAGEMENT.—Prest., J. H. Richardson; Supt., J. B. Tuckerman. Rept. by Supt., June 6. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 11, '82.

128. **GOSHEN,** Orange Co. (2,907.) Built in '71 by village. SUPPLY.—Springs, by gravity from impounding reservoir. Drainage area, 250 acres. RESERVOIR.—Cap., 46,000,000 galls.; area, 23 acres; one mile from town. FISCAL YEAR CLOSED Mar. 18. DISTRIBUTION.—Mains, 5 miles. Taps, 260. Services, iron. Meters, 0. Hydrants, 61. PRESSURE.—Ordinary, 56 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $31,500: $6,000, at 7%; $20,500, at 5%, due in annual payments of $1,000; $5,000, at 4%. Expenses, $1,655: Operating, $30; int., $1,625. Revenue: Consumers, $1,900. MANAGEMENT.—Trustees. NOTE.—No report since '89-90 Manual. REFERENCE.—Eng. News, July 29, '82.

129. **GOUVERNEUR,** Saint Lawrence Co. (3,458.) Present works owned by village. In '67 Gouverneur Water-Works Co. built works. In '90 village built works, putting them in operation Jan. 1, '91, and bought 2.16 miles Co.'s 4-in. iron pipe and 12 hydrants, paying same price as paid contractor for new pipe laid. About 2 miles Co.'s wood and w. i. and cem. pipe and 12 hydrants were abandoned. SUPPLY.—Oswegatchie River, pumping to stand-pipe. PUMPS.—Cap., 1,150,000 galls.; two Deane comp. Force main (in '90), 10-in. spiral weld steel pipe, 2,700 ft. long. STAND-PIPE.—Cap., 210,000 galls.; 30 × 40 ft. DISTRIBUTION.—Mains, 7 miles. Hydrants, 26. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $60,000. Bonded debt, $60,000, at 3½%. MANAGEMENT.—Water Comrs. NOTE.—No official report since '90-1 Manual. REFERENCES.—Eng. News, Feb. 18, '82; pumps and stand-pipe, Jan. 24, '91.

130. **GOWANDA,** Erie and Cattaraugus Cos. (2,000, est.) Built in '87 by Gowanda Water-Works Co. FRANCHISE.—Perpetual. Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 3,000,000 galls. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 4 miles; cost extensions met by rentals. Taps, 125; made by consumer. Services, iron; paid for by consumer. Meters, 1; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for canning co. Hydrants, 17. CONSUMPTION, unknown. PRESSURE.—Ordinary, 76 lbs. One steam fire engine is used. FINANCIAL.—Cost, $23,000. Cap. Stock: Authorized, $20,000; all paid-up; paid 11½% div'd. No debt. Expenses, $275: Operating, $150; taxes, $125. Revenue: City, fire protection, $680. MANAGEMENT.—Prest., W. W. Welch; Secy. and Supt., Fred J. Blackmore. Treas., J. Eugene Van Deusen. Rept. by Co., June 6. SEWERS.—Has sanitary and storm sewers.

131. **GRANVILLE,** Washington Co. (1,700, est.) Owned by village since Dec., '95. Built in '84 by Co. SUPPLY.—Mettawee River, pumping from storage reservoir direct and to distributing reservoir. PUMPS.—Cap., 2,000,000 galls.; Knowles. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by taxes. Taps, 300; made by consumer. Services, w. i.; paid for by consumer. Meters, 4; owned, controlled and repaired by village; yearly rental, 20% of cost. Are just beginning to use meters. Village can compel their use and any consumer may have one. Hydrants, 40. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $20,000, at 4%, due 1905. Expenses, $1,600: Operating, $800; int., $800. Revenue: Consumers, $2,800. MANAGEMENT.—Prest., Wm. H. Hughes; Secy., J. E. Seely; Treas. and Supt., John W. Edwards; Ch. Pump. Engr., D. D. Nelson. Rept. by Secy., June 6. PROJECTED IMPROVEMENTS.—New pump and power house. SEWERS.—Has partial system of sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 28, '85.

36. **GRAVESEND,** Kings Co. See Brooklyn.

132. **GREENBUSH** (P. O., East Albany ?) Rensselaer Co. (7,301.) Built in '87 by Greenbush Water-Works Co. Application made in '94 (probably granted) to change name to East Albany Water Co. Greenbush, East Albany and Bath-on-Hudson are one municipality and are supplied by these works. FRANCHISE.—Does not provide for purchase of works by city. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Well, 20 × 30 ft., and Hudson River, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. STAND-PIPE.—Cap., 293,700 galls.; 25 × 80 ft. DISTRIBUTION.—Mains, 10 miles. Taps, 382. Services, galv. i. Meters, 9. Hydrants, 83. CONSUMPTION.—(Galls.) av., 323,466. PRESSURE.—Ordinary, 80 to 100 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $200,000. Bonded debt, $155,000, at 6%. Expenses: Operating, $3,600. Revenue, $13,200: Consumers, $8,400; City, fire pro-

tection, $4,800. MANAGEMENT.—Prest., Andrew Fennessy. SEWERS.—Has sewers. NOTE.—No official rept. since '90-1 Manual.

D 8. **GREENE,** Chenango Co. (1,067.) Built in '84 by Brookside Water-Works Co. for domestic supply. Supply, springs and wells, by gravity and pumping to reservoir. Pump, Marsh. Mains, 3 miles; 6-in. c. i. No public, but some private hydrants, supplied without charge. Pressure, ordinary, 45 lbs. Cost, $10,000. Cap. Stock, common, authorized, $9,000. Expenses: Operating, $200. Prest., J. D. Van Valkenburgh; Secy., R. A. Race. Rept. by Prest., Jan. 16, '97. Has sewers.

133. **GREEN ISLAND** (P. O., Troy), Albany Co. (4,463.) First supplied in '78 from extension West Troy Works; in '88 Green Island Water Co. built works. West Troy is now supplied from latter works. FRANCHISE.—10 yrs. SUPPLY.—Hudson River, pumping to stand-pipe and direct. PUMPS.—Cap., 4,000,000 galls.; two 2,000,000 Worthington comp. cond. STAND-PIPE.—Cap., 420,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 210. Meters, 3. Hydrants, 53. PRESSURE.—Ordinary, 70 to 100 lbs. FINANCIAL.—Cost, $125,000. Debt, $78,000, at 6%. Expenses: Operating, $500; int., $4,680. Revenue, $11,000: Consumers, $8,000; City, $3,000. NOTE.—No report since '89-90 Manual.

134. **GREENPORT,** Suffolk Co. (2,500, est.) Built in '89 by Greenport City Water Co. FRANCHISE.—Unlimited; provides for purchase of works by city after 10 yrs., price to be net income capitalized at 4%. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay for 10 hydrants at $25 each per yr. SUPPLY.—Four driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; two Worthington non-cond., 1,000,000 comp. and 500,000 non-comp. Anthracite pea coal used; av. cost, $3.30 per short ton. STAND-PIPE.—Cap., 235,000 galls.; iron, 20 × 100 ft. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by revenue. Taps, 200; made by Co., paid by consumer at $3. Services, iron; paid for by consumer. Hydrants, public, 10; private, 1. CONSUMPTION.—(Galls.) max., 60,000; min., 50,000. PRESSURE.—Ordinary, 40 lbs.; fire, 60-80 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $60,000; all paid-up; paid no div'd in '95. Bonded debt, $40,000, at 6%, due in 20 yrs. Expenses: Operating, $1,500; taxes, $237. Revenue, $3,900. MANAGEMENT.—Prest., Dr. C. N. Hoagland; Secy., Chas. O. Gates; Treas., Geo. P. Tangeman; Supt., Geo. Doyle. Rept. by Prest., Sept. 16. SEWERS.—Has partial system of sanitary sewers.

135. **GREENVILLE,** Greene Co. (1,951, town.) Built in '96 by Greenville Water Co. Contr., J. Vaughn. SUPPLY.—By gravity, from reservoir. NOTE.—Rept. by G. G. McCabe, Nov. 12, '96. Press rept., Sept. 12, '96, states Co. has cap. stock of $10,000, and that Chas. L. Andrus, Stamford; R. B. Robinson, Roxbury, and others were directors.

136. **GREENWICH,** Washington Co. (1,663.) Built in '87 by Co. Enlarged in '95; Engr., John Marsh, North Adams, Mass. FRANCHISE.—100 yrs. from '87. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Springs and brooks, by gravity from storage reservoirs. RESERVOIRS.—Cap., 8,500,000 galls. Storage, 6,500,000 and 2,000,000, 2 and 3½ miles distant. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by loans on mortgage. Taps, 164; made by Co. for $5. Services, galv. i.; paid for by consumer. Meters, 2; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for manufacturing cos. Hydrants, public, 28; private, 2. CONSUMPTION.—(Galls.) av., 75,000; max., 300,000; min., 25,000. PRESSURE.—Ordinary, 60 lbs.; fire, 95 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock, authorized, $30,000. Floating debt, $8,000. Expenses, $1,980: Operating, $1,000; int., $480; taxes, $500. Revenue, $3,930: Consumers, unmetered, $2,800; City, fire protection, $1,130. MANAGEMENT.—Prest., Henry Gray; Secy., C. L. Morey; Treas., Le Roy Thompson; Supt., Harry C. Gray. Rept. by Supt., July 17. PROJECTED IMPROVEMENTS.—General use of meters. SEWERS.—None.

61. **GREYCOURT,** Orange Co. (est., 100.) Supply from Chester.

137. **GROTON,** Tompkins Co. (1,280.) Built in '88 by village. SUPPLY.—Spring, by gravity. RESERVOIRS.—Cap., 400,000 galls.; 70 × 90 × 14 ft. deep; about ¼ mile from and 210 ft. above main street. DISTRIBUTION.—Mains, 5½ miles. Taps, 69. Meters, 0. Hydrants, 45. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $23,000. Bonded debt, $23,000, at 3½%. Sinking Fund, $1,200, at 3½%. Expenses: Operating, $754. Revenue: Consumers, $1,200. MANAGEMENT.—Comrs. Secy. and Supt., Wm. D. Baldwin. NOTE.—No information since '92.

D 16. **HADLEY,** Saratoga Co. See Luzerne.

138. **HAMBURGH,** Erie Co. (1,331.) Built in '89 by Hamburgh Water & Electric Light Co. SUPPLY.—Surface well, pumping to stand-pipe. Well is 50 × 20 ft. PUMPS.—Cap., 1,250,000 galls.; two Buffalo. STAND-PIPE.—Cap., 459,000 galls.; 25 × 125 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 5 miles. Taps, 125. Meters, 0. Hydrants, 28. CONSUMPTION.—(Galls.) av., 190,000. PRESSURE.—Ordinary, 72 lbs. FINANCIAL.—Cap. Stock: Authorized, $50,000; paid-up, $25,000. Debt, $21,000, at 6%. Expenses, $1,885: Operating, $575; int., $1,260; taxes, $50. Revenue, $2,260: Consumers, $1,200; City, $1,060. NOTE.—No report since '90-1 Manual.

139. **HAMILTON,** Madison Co. (1,744.) Combined water and electric light plant built in '95 by city. Engrs., Stanwix Eng. Co., Rome. Contrs., Flood & Sherrill, Sandy Hill, and others. SUPPLY.—18-in. tile line from Spring Lake, 1½ miles north of city. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Nordberg direct-acting. Anthracite pea coal used; av. cost, $3.25 per short ton. FILTER BED.—Cap., 750,000 galls. TANK.—Cap., 180,000 galls.; steel, 30 × 37½ ft., on solid masonry foundation; enclosed in masonry. DISTRIBUTION.—Mains, 7½ miles. Taps, 108; made by village for $7.50 for ½-in. Services, galv. i.; paid for by consumer. Meters: 56; owned by city and consumer; controlled by city; repairs paid by the party at fault; yearly rental, $2 for ½-in. Use of meters compulsory for consumers other than private residences. City can compel use of meters and any consumer may have one. Hydrants, 67. CONSUMPTION.—(Galls.) av., 30,000; max., 35,000; min., 25,000. PRESSURE.—Ordinary, 100 lbs. MANAGEMENT.—Prest., Wm. M. West; Secy., Jas. M. Taylor; Treas., M. Tripp; Supt., E. L. Kingsbury. Rept. June 18.

140. **HAMMONDSPORT,** Steuben Co. (934.) Built in '95 by village; put in operation Jan. 1, '96. Engr., Le Grand Brown, Rochester. Contr., I. W. O'Connors, Syracuse. SUPPLY.—Springs, pumping (?) to tank. TANK.—Cap., 530,000 galls.; steel, 60×25 ft., on steel trestle. DISTRIBUTION.—Taps, 63; made by consumer for $7, including service, to curb. Services, iron and lead; paid for by consumer. Meters: 63; owned and repaired by consumer; controlled by village. Use of meters compulsory for all consumers. Hydrants, 45. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Cost, $24,500. Bonded debt, $25,000, at 4%; due in 20 yrs. MANAGEMENT.—Prest., G. H. Wheeler; Secy., L. H. Brown; Treas., L. D. Masson; Supt., J. W. Keeler. Rept. by Supt., June 9. SEWERS.— Has storm sewers only.

141. **HANCOCK,** Delaware Co. (1,279.) Built in '88 by Hancock Water Co. FRANCHISE.—99 yrs.; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, by gravity from two reservoirs (a 500,000 simple high pressure Worthington pump rept. by maker). RESERVOIR.—Cap. (of one, in '89), 3,000,000 galls. FISCAL YEAR CLOSED Aug. 20, '96. DISTRIBUTION.—Mains, 3½ miles. Taps, 75. Services, lead. Meters, 0. Hydrants, 27. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $12,000; all paid-up; paid no div'd in '96. Bonded debt, $18,000, at 6%; due 20 yrs. Revenue, $1,600. MANAGEMENT.—Prest., Thos. Kerry; Supt., Saml. N. Wheeler. Rept. by Supt., Oct. 7.

12 Conn., **HARRISON,** Westchester Co. (1,485, town.) Supply from Greenwich, Conn., through mains of Portchester, N. Y. works.

—— ?. **HARTWICK,** Otsego Co. (1,894, town.) Press repts., Oct. '96, state that Hartwick Water-Works Co. had just been incorp. with cap. stock of $18,000, and Rufus P. Luce, Jno. M. McClellan and others as directors; also that works were nearly completed, intimating that they would furnish water for domestic use and fire protection.

221. **HASTINGS-UPON-HUDSON,** Westchester Co. (1,466.) Supply from North Tarrytown.

142. **HAVERSTRAW,** Rockland Co. (5,170.) Built in '86-7 by Haverstraw Water Co. In '90 Co. leased works of West Haverstraw Water Co. guaranteeing int. on their bonded debt of $60,000. FRANCHISE.—Provides for purchase of works by city in 1902, at cost of construction. Rates neither fixed in franchise nor subject to regulation by city. SUPPLY.—Dorman Stream and Minisceongo Creek, by gravity from impounding reservoir. (A 500,000-gall. hor. dup. pump rept. by maker.) RESERVOIRS.—Cap., 602,000,000 galls. Minisceongo Creek: Storage, 600,000,000; partly to furnish compensation water to Garner Print Works, of Garnersville. Dorman Stream: 2,000,000; 3 miles from and 165 ft. above village. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 16 miles. Taps, 400. Services, galv. i. Hydrants, 65. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary 75 lbs. FINANCIAL.—Cost, $200,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $40,000, at 6%. Expenses, $4,300: Operating, $1,500; int., $2,400; taxes, $400. Revenue, $13,000: Consumers, $10,000; City, $2,000; other purposes, $1,000. NOTE.—No report since '90-1 Manual.

143. **HEMPSTEAD,** Queens Co. (4,831.) Built in '90 by Hempstead Water Co.; put in operation May, '91. FRANCHISE.—5 yrs. from '96. City to pay $1,200 per yr. for original public service and $300 for each mile of extension. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., not given; Gaskill dup. 500,000 each. Bituminous coal used; av. cost, $4.10 per short ton. STAND-PIPE.—Cap., 258,000 galls.; iron; 20 × 110 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 190; made by Co. Services, lead; paid for by consumer. Hydrants, 75. CONSUMPTION. — (Galls.) av., 200,000. PRESSURE.—Ordinary, 45 lbs.; fire, 70 lbs. One steam fire engine is used. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $60,000; all paid-up. Bonded debt, $47,000, at 6%; due 1910. Expenses, $5,470: Operating, $2,500; int., $2,820; taxes, $150. Revenue, $4,750: Consumers, $3,400; City, fire protection, $1,200; street sprinkling, $150. MANAGEMENT.—Prest., Chas. E. Kimball, 45 Wall St., N. Y. City; Secy. and Treas., M. F. McLanahan, 66 Broadway, N. Y. City; Supt., M. A. Driscoll; Ch. Pump. Engr., J. W. Weiss. Rept. by H. H. Bowly, 45 Wall st., N. Y. City, June 24. SEWERS.—None. REFERENCE.—Eng. News, Feb. 28, '85.

144. **HERKIMER,** Herkimer Co. (4,666, town.) Built in '88 by village. SUPPLY.—Driven wells, pumping through distribution to tank. In '89 there were 34 2-in. wells, about 20 ft. deep in valley of West Canada Creek, nearest being 100 ft. from creek. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Knowles comp. cond. Bituminous coal used; av. cost, $2.35 per short ton on dock. TANK.—Cap., 530,000 galls.; 60 × 25 ft.; 7-16 to 5-16-in. steel plates; bottom is 155 ft. above Main and German Sts. FISCAL YEAR CLOSED Mar. 31, '96. DISTRIBUTION.—Mains, 9 miles; cost extensions met by maintenance account. Taps, 768; made by village, free. Services paid for by consumer. Meters: 26; owned by village. Use of meters compulsory for manufacturers; allowed only to large consumers. Hydrants, public, 62; private, 5. CONSUMPTION.—(Galls.) av., 323,451. PRESSURE.—Ordinary, 77 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $68,210. Bonded debt, $57,000, at 3½%; due 1908. Expenses, $4,543: Operating, $2,631; int., $1,912. Revenue, $6,637: Consumers, unmetered, $5,562; metered, $1,075. MANAGEMENT.—Prest., C. R. Snell; Secy. and Supt., E. W. Sluyter; Treas., M. L. Hayadorn; Ch. Pump. Engr., Wm. Creyo. Rept. by Supt., June 5. SEWERS.—Has sanitary and partial system of storm sewers.

145. **HIGHLAND,** Ulster Co. (Est., 1,570.) Built in '93 by Highland Water-Works Co. Engr., David H. Merritt. Contr., B. Van Steenbergh. FRANCHISE.—Renewed yearly. SUPPLY.—Springs on mountains, by gravity. RESERVOIRS.—Cap., 7,300,000 galls.; storage, 4,800,000; distributing, 2,500,000. DISTRIBUTION.—Mains, 7½ miles. Taps, 75. Services, galv. i.; paid for by consumer. Meters: 24; owned by Co.; yearly rental, $2. Co. can compel use of meters and any consumer may have them. Hydrants, 30. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $38,000. Cap. Stock: Authorized, $14,000; all paid-up. Bonded debt, $25,000, at 5%; due in 1925. Expenses, $1,550: Operating, $300; int., $1,250. Revenue: City, fire protection, $500. MANAGEMENT.—Prest., Aaron Rhodes; Secy., J. W. Feeter; Treas., L. B. Maynard; Supt., D. H. Merritt. Rept. by Henry W. Millar, Utica, July 21.

146. **HILLBURN,** Rockland Co. (900, est.) Bought by Mountain Spring Water Co. in '93 and extended; Contr., Wm. R. Lee; built in '73 by Ramapo Wheel & Foundry Co. Until about '93 water was furnished for domestic use only. FRANCHISE.—Rates are not subject to regulation by village. Co. is not exempt from local taxes. Village to pay $500 per yr. for 25 hydrants; contract expires in 1900. SUPPLY.—Mountain stream, by gravity in winter; driven wells, by pumping in summer. PUMP.—Cap., 720,000 galls.; Worthington, underwriter's. No. 2 Buckwheat coal used; av. cost, $1.85 per short ton. RESERVOIR.—Cap., 40,000 galls.; distributing. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 6 miles; cost extensions met by receipts or new stock, depending on the size. Taps, 200; made by consumer. Services, galv. i.; paid for by consumer. Meters: 6; owned by consumer; controlled by Co.; repairs paid by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 25; private, 2. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock; Authorized, $50,000; paid-up, $29,000; paid 5% div'd in '96. No preferred stock or debt. Expenses, $1,000: Operating, $734; taxes, $266. Revenue, $3,000: Consumers, $2,500; City, fire protection, $500. MANAGEMENT.—Prest., W. W. Snow; Secy., J. J. Traphagen, Suffern; Treas., J. L. Suffern; Supt., E. J. Snow; Ch. Pump. Engr., W. G. Easton. Rept. by Supt., July 6. SEWERS.—None. REFERENCE.—Eng. News, Mar. 17, '83.

147. **HOBART,** Delaware Co. (561.) Built in '87 by Hobart Water Co. SUPPLY.—Brook, by gravity; filtered through charcoal. RESERVOIRS.—Cap., 4,880,000 galls.; old, 380,000; new (press rept.), 4,500,000. FISCAL YEAR CLOSED Sept. 15, '96. DISTRIBUTION.—Mains, 2 miles. Taps, 50. Services, lead. Meters, 0. Hydrants, 14. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $11,300. Cap. Stock: Authorized, $12,000; paid-up, $10,650; paid 3% div'd in '96. Floating debt, $4,000. Expenses, $380: Operating, $100; int., $240; taxes, $40. Revenue, $700: Consumers, $500; Village, fire protection, $200. MANAGEMENT.—Prest., W. R. Brock; Secy., Francis Leonard, Norwalk, Conn.; Treas., J. S. McNaught; Supt., C. A. Hanford. Rept. by Supt., Oct. 6.

148. **HOLLAND,** Erie Co. (582.) Built in '91 by Holland Water-Works Co.; put in operation Dec. 10, '91. No engr. Contrs., Ayrault Bros., Tonawanda. FRANCHISE.—99 yrs. from 1891. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $250 per yr. LEGAL DIFFICULTIES.—C. Whitcher & Co. claimed ownership to center of highway and that authorities could not give franchise; case was carried to Court of Appeals, the water company beating in every court. SUPPLY.—Springs, by gravity; pumping from well for reserve. Well yields about 20,160 galls. per day. RESERVOIRS.—Storage and distributing. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 3 miles; cost extensions met by earnings of Co. Taps, made by Co. for $8. Services, wrought iron; paid for by consumer. Meters, 0. Hydrants, 16. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost, $11,000. Cap. Stock: Authorized, $10,000; all paid-up. No dividend declared, money expended in extensions. Floating debt, $100, at 5½%; Bonded none. Revenue, City, fire protection, $250. MANAGEMENT.—Prest., W. B. Jackson; Secy. and Supt., C. M. Sill; Treas., Asher Cutler; Ch. Pump. Engr., Joseph Schlumen. Rept. by Co., June 27. SEWERS.—Has sanitary and storm sewers.

33. **HOLLEY,** Orleans Co. (1,381.) See Brockport and Holley.

149. **HOMER,** Cortland Co. (2,526.) Owned by Homer Water Supply Co.; built in '86 by Homer Water-Works Co., and sold (press rept.) under foreclosure in '94 to parties who organized new Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. City to pay $43 per hydrant per yr.; contract 10 yrs. from '96. SUPPLY.—Springs, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Worthington comp. cond. STAND-PIPE.—Cap., 150,000 galls.; 25 × 40 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 95. Services, galv. i. Meters: 6. Hydrants (in '91), 54. CONSUMPTION.—(Galls.) av., 855,542. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $50,000. Debt, $45,000, at 6%. Expenses: Operating, $1,000; int., about $2,700. Revenue: Consumers, $2,400; City, $1,650. NOTE.—No official report since '89-90 Manual.

D 9. **HONEOYE FALLS,** Monroe Co. (1,128.) Built in '88 by Honeoye Falls Water-Works & Improvement Co. for domestic service. Franchise, perpetual; no control or regulation of rates by village. Supply, wells, pumping to wooden tank. Natural gas used as fuel at 20 cts. per 1,000 ft., net. Fiscal year closed Feb. 24, '96. Taps, 125. Services, iron, paid for by consumer. Meters, 0. Cost, $3,500. Cap. Stock, authorized, $2,500; all paid up. No debt nor bonds. Operating expenses, $325. Revenue, Consumers, $450 to $500. Prest., S. Wilcox; Secy. and Treas., J. D. Martin; Supt., A. D. Crone; Ch. Pump. Engr., Geo. F. Brown. Rept. by Secy., June 4.

150. **HOOSICK FALLS,** Rennselaer Co. (7,014.) Built in '86-7 by Hoosick Falls City Water Supply Co. FRANCHISE.—20 yrs. from '86; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $3,120 for 89 hydrants, $75 for two drinking fountains, $156 for sewer flushing and $36 for hose houses. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Russell and Knowles, 1,000,000 each. Eureka and Souman coal used; av. cost $3.75 per short ton. STAND-PIPE.—Cap., 320,000 galls.; iron; 35 × 40 ft., on concrete foundation. FISCAL YEAR CLOSED Nov. 1, '96. DISTRIBUTION.—Mains, 8½ miles. Taps, 720; made by Co. Services, galv. i.; paid for by Co. to street line. Meters: 13; owned, controlled and repaired by consumer. Co. cannot compel use of meters, but may prohibit them. Hydrants, public, 89; private, 2. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $100,000, at 5%; due 1906. MANAGEMENT.—Prest., Geo. H. Norman, Newport, R. I.; Secy. and Supt., E. R. Estabrook; Treas., G. Norman Weaver, Newport, R. I.; Ch. Pump. Engr., John Hughes. Rept. by Supt., June 11. SEWERS.—Has sanitary and storm sewers.

151. **HORNELLSVILLE,** Steuben Co. (10,996.) Built in '81 by Hornellsville Water Co.; now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—Does not provide for purchase of works by city. Maximum rates are fixed in franchise. SUPPLY.—Mountain streams, by gravity from impounding reservoir. RESERVOIR.—Cap., 60,000,000 galls.; area 15 acres; 5 miles from, 220 ft. above, village. DISTRIBUTION.—Mains, 21 miles. Hydrants, 146. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., James S. Kuhn, McKeesport, Pa.; Secy. and Treas., A. E. Clancy; Supt., W. E. Waldorf. Rept. by Am. W.-W. & G. Co., Aug. 20. REFERENCE.—Eng. News, Jan. 6, '83

152. **HUDSON,** Columbia Co. (9,970.) Present works built in '74-5 by city. Early in century domestic supply was introduced through iron pipe from spring 2 miles distant. SUPPLY.—Hudson River, pumping to filters; filtered water passes to storage and distributing reservoirs. PUMPS.—Cap., 3,000,000 galls.; Clapp & Jones. Anthracite pea coal used; av. cost, $2.75 per short ton. FILTER BEDS.—Two, with combined area of 82,088 sq. ft.; filtering material, 6 ft. of sand, gravel and broken stone, resting on concrete. RESERVOIRS.—Cap., 6,000,000 galls.; two, at elev. of 320 ft. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 11 miles; cost extensions met by taxation. Taps, 1,500; made by city for $4 for ¾-in. and $5 for ¾-in. Services, lead; paid for by property owner. Meters, 0. Hydrants, public, 187. CONSUMPTION.—(Galls.) av., 1,146,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Total bonded debt, $45,500: $500, at 4%; due '97; $20,000, at 7%; due '98; $25,000, at 3½%; due '99. Expenses: Operating, $12,150. Revenue: City, fire protection, $3,100; street sprinkling, $75. MANAGEMENT.—Prest., C. H. Evans; Secy., Wm. S. Hallenbeck; Treas., C. W. Bostwick; Supt., W. C. Niblett; Ch. Pump. Engr., F. Van Burschoten. Rept. by Secy., June 6. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, July 28, '81; sand filtration, June 14, '94; Sept. 12, '95.

153. **HUNTINGTON,** Suffolk Co. (3,028.) Built in '93 by Huntingdon Water-Works Co.; put in operation in June. Engr. and Contr., Oscar Darling, Babylon. FRANCHISE.—30 yrs. from '90; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. SUPPLY.—Wells, two 6-in. and one 8-in., pumping to reservoir. PUMPS.—Cap., 800,000 galls.; 2—4,000,000 Worthington; a comp. non-cond. and a simple high pressure. Anthracite nut coal used. av. cost, $4.70 per short ton. RESERVOIR.—Cap., 250,000 galls.; distributing, 170 ft. above tide water. FISCAL YEAR CLOSED Dec. 1, '96. DISTRIBUTION.—Mains, 8 miles; cost extensions met by capital fund. Taps (Dec., '96), 145; made by Co. for $3, including goose-neck. Services, galv. i.; paid for by consumer. Meters: 10; owned and repairs paid by consumer; controlled by Co. Use of meters optional with consumer. Hydrants, 39. CONSUMPTION.—(Galls.)

av., 42,298; max., 51,981; min., 29,433. PRESSURE.—Ordinary, 45 lbs.; fire, 50 lbs. FINANCIAL.—Cost, $47,900. Cap. Stock, $27,100; paid 6% div'd in '96. Pref'd, authorized, $30,000; all paid-up. Bonded debt, $20,000, at 5%; due in 1923, or optional after 10 yrs. No sinking fund. Expenses, $3,370: Operating, $2,010; int., $1,000; taxes, $360. Revenue, $3,983: Consumers, unmetered, $2,550; metered, $128; City, fire protection, $1,180; street sprinkling, $125. Surplus, $1,421. MANAGEMENT.—Prest., E. D. Davidson; Secy., John F. Wood; Treas., Jos. Irwin; Supt. and Ch. Pump. Engr., H. W. Ketcham. Rept. by Treas., Jan. 4. No sewers.

154. **ILION,** Herkimer Co. (4,057.) Built in '92 by city; put in operation in Sept. Engrs., Stanwix Eng. Co., Rome. Contr., J. J. Rumsey, Fostoria O. SUPPLY.—Hawks Brook, by gravity. Drainage area, 6 sq. miles. An 8-in. c. i. pipe, 6,000 ft. long, conveys water from intake on brook to storage reservoir near filter beds. FILTER BED.—Cap., 500,000 galls.; area, 6,080 sq. ft.; filtering material, 3 ft. of sand and gravel, resting on brick underdrains. RESERVOIRS.—Cap., 15,500,000 galls.; storage, 15,000,000; clear water, 500,000; 267 ft. above lowest portions of village. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by taxation. Taps, 560; made by consumer. Services, lead; paid for by city. Meters: 7; owned and controlled by city; yearly rental, 10% of cost. Use of meters compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 113; private, 5. CONSUMPTION.—Sewer flushing, alone, consumes 150,000 galls. daily. PRESSURE.—Ordinary and fire, 120 lbs. One steam fire engine; not used. FINANCIAL.—Cost, $95,000. No sinking fund. MANAGEMENT.—Comrs.: Prest., Thos. Ringwood; Secy., A. N. Russell; Treas., C. M. Gray; Clk., Geo. O. Rasbach. Rept. by Comrs., June 10. SEWERS.—Has sanitary sewers. REFERENCE.—Sand filter-beds, fountains and details, Eng. News, June 7, '94, illus. and inset.

103. **INWOOD,** Queens Co. (1,277.) Supply from Far Rockaway.

155. **IRVINGTON,** Westchester Co. (2,299.) Built in '84 by village. SUPPLY.—Stream and artesian well, pumping to reservoir. Well, 8 ins. diam., 605 ft. deep. PUMPS.—Cap., 250,000 galls.; Worthington non-comp. non-cond. RESERVOIRS.—Cap., 9,000,000 galls.; 1½ miles from, 412 ft. above village. DISTRIBUTION.—Mains, 5 miles. Taps, 100. Services, lead. Meters, 100. Hydrants, 25. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 140 to 186 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $40,000, at 4%. Expenses, $2,500; int., $1,600. Revenue, $1,200. NOTE.—No report since '89 Manual. REFERENCES.—Eng. News, Oct. 14, '82; Mar. 21, '85.

28. **ISLIP,** Suffolk Co. See Bay Shore.

156. **ITHACA,** Tompkins Co. (11,079.) Built in '72 by Ithaca Water-Works Co. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. No legal difficulties. SUPPLY.—Buttermilk and Six Mile Creeks, by gravity and pumping. Drainage area, 10 sq. miles. PUMPS.—Cap., 1,500,000 galls.; Deane power pump, 500,000; and Worthington steam, non-comp. non-cond., 1,000,000. RESERVOIRS.—Cap., 12,850,000 galls.; Impounding, 10,000,000. Distributing: No. 1, 1,500,000; and No. 2, 1,350,000. TANK.—Cap., 626,000 galls.; iron (for high service); 60 × 80 ft. DISTRIBUTION.—Mains, 22 miles. Taps, 800; made by Co. Services, galv. i. and lead; paid for by consumer. Meters: 8; owned, controlled and repaired by Co.; yearly rental, 10% of cost. Use of meters optional with Co.; compulsory for special cases. Hydrants, public, 101; private, 1. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 60 to 100 lbs. FINANCIAL.—Cost, $350,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $200,000, at 5%. MANAGEMENT.—Prest. and Treas., L. L. Treman; Secy. and Supt., E. M. Treman. Rept. by Supt., Oct. 1. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Dec. 16, '82.

157, 158, 159. **JAMAICA,** Queens Co. (5,861.)

JAMAICA WATER SUPPLY CO.

Built in '87. FRANCHISE.—Rates must not be higher than in Brooklyn; does not provide for purchase of works. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Holly hor. dup. TANK.—Cap., 795,000 galls.; 50 × 40 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 11 miles. Taps, 250. Services, galv. i. Meters: 8. Hydrants, 240. CONSUMPTION.—(Galls.) av., 240,000. PRESSURE.—Ordinary, 56 lbs. FINANCIAL.—Cost, $181,000. Cap. Stock: Authorized, $75,000; all paid-up. Bonded debt, $100,000, at 6%. Expenses, $9,250: Operating, $3,000; int., $6,000; taxes, $250. Revenue, $10,000: Consumers, $4,500; City, $3,000; other purposes, $2,500.

JAMAICA TOWNSHIP WATER CO.

General Description.—Built in '88-9. Water taken from Jamaica Water Supply Co. to supply Morris Park, Richmond Hill and Long Island R. R. shops. Mains, 5 miles. Management.—Same as above.

NOTE.—Above information is that given by representatives of Cos. for '90-1 Manual. Co. stated in '96 that above was incorrect, but refused to give any other information. Press rept., June, '94, stated 5-yr. contract had been made with Jamaica Water Co. at $20 per hydrant per yr.

WOODHAVEN WATER SUPPLY CO.

Press rept., June, '94, stated town had just contracted with Co. for 5 yrs. SUPPLY.—Driven wells (by pumping?). RESERVOIRS.—Cap., 5,000,000 galls.; two storage. DIS-

TRIBUTION.—Mains 30 miles. Hydrants public, 275; private, 25. FINANCIAL.—Cap. Stock: Authorized, $100,000; all paid-up. MANAGEMENT.—Prest., F. Grosjean; Secy., James Cochran, P. O. Box 301, N. Y. City; Treas., E. W. Martin; Supt., F. H. Luce. Rept. by Secy., Nov. 24.

160. **JAMESTOWN,** Chautauqua Co. (16,038.) Now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. Built in '82 by Jamestown Water Supply Co. Supplies Falconer. SUPPLY.—Artesian wells, direct pumping. PUMPS.—Cap., 14,000,000 galls.; 3,000,000 Holly; 4,000,000 Holly-Gaskill hor. high duty; 3,000,000 Hall; 3,000,000 Gordon. DISTRIBUTION.—Mains, 49 miles. Hydrants, 197. PRESSURE.—Ordinary, 80 lbs.; fire, 80-120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., James S. Kuhn, McKeesport, Pa.; Secy. and Treas., J. H. Purdy. Supt., D. W. Immel. Rept. by Am. W.-W. & G. Co., Aug. 20. REFERENCE.—Eng. News, Nov. 18, '82.

161. **JEFFERSON,** Schoharie Co. (1,469, town.) Built in '93 by Co.; put in operation Jan. 1, '94. No Engr. Contr., R. H. Strong, 236 Washington Ave., Albany. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. Fire district to pay for hydrants for term of ten years. SUPPLY.—Spring brook, by gravity. FILTERS.—Charcoal. RESERVOIRS.—Cap., 1,000,000 galls.; storage; elev., 200 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 2 miles. Taps, 38; made by Co. for $8. Services, lead and iron; paid for by consumer. Meters, 0. Hydrants, 16. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 75 to 100 lbs. FINANCIAL.—Cost, $6,200. Cap. Stock: Authorized, $3,000; all paid-up. Debt, $3,000. Expenses: Taxes, $41. Revenue: Consumers, $462; City, fire protection, $160. MANAGEMENT—Prest., C. E. Nichols; Secy., E. W. Moxley; Treas., B. H. Avery; Supt., W. E. Stanley.

D 10. **JEFFERSONVILLE,** Sullivan Co. (Est., 670.) Built in '96 by Jeffersonville Water-Works Co.; put in operation Sept. 1. Engr. and Contr., Frank Lober. No compensation for public service. Supply, Springs, by gravity; 60,000-gall. reservoir. Taps, 11. Use of meters optional with consumer. Hydrants, 1. Consumption (Galls.), av., 30,000. No debt. Prest., Frank Lober; Secy., M. Lober; Treas., L. Lober; all of 598 W. 151st st., N. Y. City; Supt., Wm. T. Grishaber. No sewers.

162. **JOHNSTOWN,** Fulton Co. (7,768.) Built in '78 by village. SUPPLY.—Springs and streams, by gravity from impounding and distributing reservoirs. RESERVOIRS.—(In '89), Impounding: Cold Brook, area, ½ acre; depth, 12 ft. Warren Brook formed by 5-ft. dam. Distributing: Cap., 10,000,000 galls.; 186 to 282 ft. above town. Reported in '91 that bids had been received for new 2,000,000-gall. reservoir. FISCAL YEAR CLOSED Jan. 31, '95. DISTRIBUTION.—Mains (in '90), 15 miles. Taps, 1,545. Hydrants, 118. PRESSURE.—Ordinary (in '89), 100 lbs. FINANCIAL.—Cost (in '90), $133,897. Bonded debt (in '90), $60,500, at 6%. Sinking Fund: $13,662. Expenses, $6,787: Operating, $3,157; int., $3,630. Revenue, $16,070; Consumers, $14,692; tapping mains, $914; misc., $464. MANAGEMENT.—Comrs.; Prest., Jonah Hess; Supt., J. J. Buchanan. SEWERS.—Has sewers. REFERENCE.—Eng. News, Aug. 27, '81.

163, D 11. **JORDAN,** Onondaga Co. (1,271.)

S. L. ROCKWELL & CO.

Built in '80. SUPPLY.—Outlet of Skaneateles lake, pumping to reservoir. DISTRIBUTION.—Mains, ¾ mile. Taps, 20. Hydrants, 12. FINANCIAL.—Expenses: Operating, $50. Revenue, $150. MANAGEMENT.—Address F. C. Reynolds. NOTE.—No report since '90-1 Manual.

JORDAN WATER CO.

Built in '89. Supply, springs, by gravity. Reservoir, cap., 900,000 galls. Mains, 8 to 4-in., cement. Rept. by Chas. F. Taylor, Syracuse, Nov. 4, '91, who also stated Co. failed to make hydrant contract and that springs "ran dry" summer of '91. No later information except implied indication that works were in operation in '96.

164. **KATONAH,** Westchester Co. (524.) Built in '96 by Co.; put in operation in Aug. Engr., E. Wegmann. Contr., D. L. Barrett, Englewood, N. J. SUPPLY.—Ground water, pumping from circular well, 12 x 12 ft., into which a 6-in. drain pipe, 200 ft. long, conveys an additional supply, pumping to tank. PUMP.—Cap., 150,000 galls.; Worthington. TANK.—Cap., 50,000 galls.; cedar; on hill, 100 ft. above main street. DISTRIBUTION.—Mains, 1½ miles. Hydrants, 1. FINANCIAL.—Cost, $7,847. MANAGEMENT.—Prest., Clarence Whitman; Secy., H. R. Barrett. Rept. by E. Wegmann, Des. Engr., Dec. 3. SEWERS.—None. NOTE.—The City of New York having condemned the village of Katonah for the new Croton reservoir, a new village has been laid out by private parties about ½ mile from the old site. Water-works have been built for the new village which is just being started, 12 houses, only, having been built thus far.

165. **KEESEVILLE,** Essex and Clinton Cos. (2,103.) Built in '83 by village. SUPPLY. — Ausable River, pumping direct. PUMPS. — Cap., 2,000,000 galls. Lang and Flanders plunger. RESERVOIRS.—Cap., 30,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by revenue. Taps, 260; made by village. Services, galv. i.; paid for by village to curb. Use of meters optional with consumer. Hydrants, 50. PRESSURE.—Ordinary, 80 lbs.; fire, 100 to 120. FINANCIAL. Cost, $37,500. Bonded debt, $19,000, at 5%; $1,000 paid each yr. Expenses: Operating, $700. MANAGEMENT.—Prest., R. Prescott; Secy. and Treas., H. M. Mould; Supt., J.

D. Cord. Rept. by Supt., June 8. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Aug. 23, '84.

D 12. **KINGSBORO** (P. O. Gloversville), Fulton Co. (Not given.) Built in '93 by Co.; put in operation about July 1. Engr., E. B. Baker, Gloversville. Supply, springs and artesian well. Reservoirs, Cap., 130,000 galls.: 2—65,000, distributing. Fiscal year closed Jan. 1, '96. Mains, 4½ miles; cost extensions met by receipts. Taps, 175; made by Co. for $7. Services, paid for by consumer. Meters, 0. Pressure, Ordinary, 40 lbs. Cost, about, $16,000. Cap. Stock: Authorized, $16,000; all paid-up; paid 5% div'd in '95. Expenses: Operating, $250; taxes, about, $100. Revenue: Consumers, about $1,600. Prest., E. L. Heacock; Secy., L. S. Brown; Treas., E. M. Brown; Supt., E. D. Heacock; all of Gloversville. Rept. by Secy., Dec. 21. Has sanitary and storm sewers.

166. **KINGSTON,** Ulster Co. (21,261.) Bought by the city March 1, '96. Built in '83 by Kingston Water Co. Kingston includes Rondout. SUPPLY.—Sawkill Creek in the Catskill Mts., by gravity from impounding reservoir. RESERVOIR.—Cap., 65,000,000 galls.; 7 miles from city, 350 ft. above mean tide, giving head of 170 ft. at Kingston and 340 ft. on strand at Rondout. Supply main (in '89), 37,500 ft. of 18-in. pipe. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 42 miles. Taps, 2,750; made by city; $7 for ¾-in. and $9.50 for ¾in., including service to curb, with curb cock and box. Services, galv. i. and lead; paid for by consumer. Meters: 88; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city; compulsory for liveries, motors and saloons. Hydrants, 332. CONSUMPTION.—(Galls.) av., 1,500,000; max., 2,000,000; min., 1,000,000. PRESSURE.—Ordinary, 65 to 140 lbs. FINANCIAL.—Cost, $468,750; paid to Co. at time of purchase. Bonded debt, press rept. June 12, '96, states $600,000 3½% bonds, due $24,000 per yr., beginning in 1912, had just been sold. Expenses: Operating, $6,000. MANAGEMENT.—Prest., S. D. Coykendall; Supt., O. C. Longyear. Rept. by Supt., June 5. PROJECTED IMPROVEMENTS.—Press repts. state that in Sept., '96, contract was let for new reservoir at $53,478; also that new supply main was contemplated. SEWERS.—Has partial system of sanitary and storm sewers. REFERENCE.—Eng. News., May 10, '84.

D 13. **LAKE GEORGE** (P. O., Caldwell), Warren Co. (Caldwell, est., 450.) Built in '89 by Lake George Water Co. Supply, mountain stream, by gravity from reservoir about two miles from and 500 ft. above village. Above from '90-1 Manual. Press rept., June, '95, stated plant had been bought by Samuel Bates.

84. **LANCASTER,** Erie Co. (1,692.) See Depew.

167. **LANSINGBURGH,** Rensselaer Co. (10,550.) Built in '84 by village; put in operation Dec.10. SUPPLY.—Wells, by gravity; and river in emergency, pumping to reservoirs. PUMPS.—Cap., 750,000 galls.; Worthington comp. non-cond. RESERVOIRS.—Cap., 120,000,000 galls.; three. FISCAL YEAR CLOSED Feb. 3, '96. DISTRIBUTION.—Mains, 17½ miles. Taps, 1,312; made by village. Services, lead; paid for by consumer. Meters: 39; owned by village. All services where motor power is in use are required to be metered. Hydrants, public, 146; private, 5. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, about $215,000. Bonded debt, $215,000, at 4%. No sinking fund. Expenses: Operating, about $8,400; int., $9,012. Revenue: Consumers, $17,543; frontage tax, $3,065. MANAGEMENT.—Chn., John Flynn; Secy., Robt. C. Comeskey; Treas., Wm. M. Lea; Supt., J. C. Golden. Rept. by Treas. and from annual rept. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 15, '86.

168. **LARCHMONT,** Westchester Co. (1,200, est.) Built in '89-90 by Larchmont Water Co. SUPPLY.—Sheldrake Lake, by gravity. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 5 miles. Taps, 185. Meters, 179. Hydrants, 29. PRESSURE.—Ordinary, 38 lbs. FINANCIAL.—Cost, $163,379. Cap. Stock: Authorized, $50,000; all paid-up. No div'd in '90 to '96, inclusive. Debt, $127,500; "first mortgages." Expenses: Operating, $1,500; int., withheld; taxes, $235. MANAGEMENT.—Prest., G. C. W. Lowrey; Secy., F. W. Flint, 487 Fifth Ave., N. Y. City; Treas., Wm. Murray; Supt., W. H. Campbell. Rept. by Treas., Oct. 5. SEWERS.—Has sewers.

169. **LAURENS,** Otsego Co. (255.) Built in '95 by Co. Engr., E. F. Musson, Norwich. Contrs., Flood & Sherrill, Sandy Hill. SUPPLY.—Springs, by gravity. RESERVOIRS.—20 × 80 × 10 ft.; roofed. Taps, 72; made by Co., including service to curb line, free. Services, galv. i.; paid for by owner to curb line. Meters, 0. Hydrants, 12. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $8,600. Bonded debt, $8,000, at 4%; due $500 a year. Expenses: Operating, unknown as yet. Revenue: City, fire protection, free; other purposes, about $450. MANAGEMENT.—Prest., A. S. Gray; Secy. and Supt., D. Peet; Treas., D. Whipple. Rept. by Secy., July 24. SEWERS.—None.

108. **LAWRENCE,** Queens Co. (626.) Supply from Far Rockaway.

170. **LEE CENTRE,** Oneida Co. (Est., 327.) Built in '52 by Co.; incorp. June 4, '96. RESERVOIRS.—Cap., not given.; storage. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by assessments. Services, lead; paid for by owner. FINANCIAL.—Cap. Stock: Authorized, $2,000; paid-up, $1,950. Floating debt, $200. MANAGEMENT.—Prest., N. Stokes. Rept. by Secy., Carl Simon, June 25. SEWERS.—None.

171. **LE ROY,** Genesee Co. (2,743.) Under construction in '96 by village. Engr., Wm. Folwell. (Alex. Potter, 137 Broadway, N. Y. City, repts. he was Engr.) Contr., Richardson. Fire protection plant built in '75. SUPPLY.—Springs, pumping to standpipe. STAND-PIPE.—Cap., 370,000 galls.; iron, 30 ft. diam. at base, 20 ft. at top, 100 ft. high. MANAGEMENT.—Prest., O. F. Hoodward; Secy., John Wiss; Treas., John Maloney. Rept. by Prest., Dec. 4. REFERENCE.—Eng. News, Apr. 29, '82.

172. **LESTERSHIRE,** Broome Co. (Not given.) Owned by village since Nov. 1, '96. Built by Gaylord & Eitapence in '91. SUPPLY.—Three artesian wells, pumping to standpipe. PUMPS.—Two dup. STAND-PIPE.—Cap., 29,000 galls.; 10 × 50 ft., steel, on stone foundation. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 500; made by village for $8. Services, galv. ¾.; paid for by village. Meters: 10; owned and repaired by consumer; controlled by village. Use of meters optional with consumer. Hydrants, 32. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $35,000. Floating debt, $26,000, at 3½%; due in 10 yrs. Expenses: Operating, $625; taxes, $125. Revenue, $4,300: Consumers, $4,000; metered, $250; street sprinkling, $50. MANAGEMENT.—Prest., S. P. Allen; Treas., L. D. Duren. Rept. by Treas., Dec. 3, '96.

173. **LIBERTY,** Sullivan Co. (734.) Built '92 by village. Contr., F. Leonard. In '87 W. Winner built small works for domestic supply, which were subsequently purchased by J. C. and Geo. Young. SUPPLY.—Springs, from impounding reservoir. PUMPS.—Cap., 590,000 galls.; 500,000 comp. non-con.; 90,000 simple high pressure. RESERVOIR.—Cap., 4,000,000 galls. DISTRIBUTION.—Mains, 3½ miles. Taps, 40. Hydrants, 28. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Bonded debt, $20,000, at 4 %. MANAGEMENT.—Trustees. PROJECTED IMPROVEMENTS.—$10,000 voted in '96 for extensions and improvements.

D 14. **LILLY DALE,** Chautauqua Co. (Not given.) Built in '93 by Cassadaga Lake Free Association, for fire protection. Supply, Cassadaga Lake pumping to tank. Cost, $5,000. Treas., T. J. S. Kidmore.

174. **LITTLE FALLS,** Herkimer Co. (8,783.) Built in '85-8 by village. SUPPLY.—Beaver Creek, by gravity. Conduit between diverting dam and reservoir is 9¼ miles long, including aerating canal; much of it is vitrified pipe; cast-iron substituted where main is under heavy pressure. Diameter ranges from 20 to 12 ins. FILTERS.—8 × 12 × 40 ft., filled with coke. Filter cleaned by reversing flow. RESERVOIRS.—Cap., 25,000,000 galls. Supply mains, one 14, one 12-in. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 30 miles. Taps, 1,457. Meters, 50. Hydrants, 140. PRESSURE.—Ordinary (in '89), 140 lbs. FINANCIAL.—Cost, $335,000. Bonded debt, $295,000; $265,000, at 3½%; $30,000, at 3½%. Sinking Fund: $10,000. Expenses, $14,800. Operating, $5,500; int., $9,300. Revenue, $27,500: Consumers, $21,000: City, fire protection, $6,500. MANAGEMENT.—Bd. of Pub. Works. Ch. Engr., S. E. Babcock. Rept. by Ch. Engr. PROJECTED IMPROVEMENTS.—New storage reservoir. SEWERS.—Has sewers. REFERENCES.—Use of vitrified pipe, Eng. News, Apr. 28, '88, Oct. 24, '95; protection of pipe against freezing, May 19, '92, illus.

175, D 15. **LITTLE VALLEY,** Cattaraugus Co. (698.)

VILLAGE WORKS.

Built in '88 by village. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 3 miles; cost extensions met by rentals. Taps, 250; made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, 17. PRESSURE.—Ordinary (in '89), 100 lbs. FINANCIAL.—Cost, $12,500. Bonded debt, $12,500, at 4%; due 1908. Sinking Fund: $2,500; in banks at 4% int. Expenses: Operating, nominal; int., $500. Revenue, about $1,000. MANAGEMENT.—Prest., W. C. Parker; Secy., S. L. Sweetland; Treas., F. M. Rich. Rept. by Secy., June 5. SEWERS.—None.

UNION WATER CO.

For domestic service only. Supply, springs. Fiscal year closed April 1. Mains, 780 ft., iron. Taps, 8. Services, iron; paid for by consumer. Cost, $350. No operating expenses, interest or debt. Taxes, $2.50. Prest., D. F. Rundell; Secy., S. L. Sweetland; Treas., C. Z. Lincoln; Supt., S. S. Benedict. Rept. by Secy., Aug. 12.

176. **LIVINGSTON MANOR,** Sullivan Co. (Est., 738.) Built in '96 by P. H. Woolsey. Small works were also built in '87 by Livingston Manor Water Co. SUPPLY.—6 springs (by gravity?); also large spring, pumping to reservoir. PUMP.—"Holliday" wind engine and pump. RESERVOIRS.—Cap., 108,000 galls; 32,000 and 75,000, roofed. DISTRIBUTION.—Mains, about 1 mile. Services, galv. ¾. Hydrants, 4. FINANCIAL.—Cost $5,000. MANAGEMENT.—Rept. by owner, P. H. Woolsey.

177. **LOCKPORT,** Niagara Co. (16,038.) Built in '63 by city. SUPPLY.—Erie Canal, pumping direct. PUMPS.—Cap., 10,000,000 galls.; 3,000,000 and 5,000,000 Holly hor. water power, with two Holly steam engines for emergency use; 2,000,000 Holly quadruplex for reserve. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 26 miles; cost extensions generally met by tax levy on those benefited. Taps, 1,350; made by consumer. Services, iron; paid for by consumer. Use of meters optional with consumer. Hydrants (in '90), 284. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 75 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $60,000. Expenses: Operat-

ing, $8,306. MANAGEMENT.—Prest., Robt. Madden; Supt., B. Burroughs; Pump. Engrs., Geo. Greenwood and Chas. Greenville. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 17, '81.

178, 179. **LONG ISLAND CITY**, Queens Co. (30,506.)

CITY PLANT.

Built in '74. SUPPLY.—Driven wells in five different localities, pumping direct. Some water is bought from Co.; see below. PUMPS.—Cap., 10,000,000 galls.; 2—2,000,000 Worthington; 3,000,000 Holly quadruplex; 3,000,000 Garrison. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Taps, 3,000; made by city; $5 for ½-in., $6 for ⅝-in., $8 for ¾-in. and $10 for 1-in. Services, galv. i. Meters: 150; repairs paid by city. Use of meters compulsory for factories and large buildings. City can compel the use of meters and any consumer may have one. Hydrants, not given. PRESSURE.—Ordinary, 25-60 lbs. Six steam fire engines are used. MANAGEMENT. — Prest., Patrick J. Gleason; Rept. by Comr. Pub. Wks., J. W. Moore. REFERENCE.—Eng. News, Mar. 31, '83.

WOODSIDE WATER CO.

Built in '96; put in operation in May. Sells water to city by the 1,000 cu. ft. (press rept.). SUPPLY.—Artesian wells and reservoirs, by pumping. PUMP.—Cap., 2,000,000; Worthington; Jan. 27, '97, a duplicate was under contract, but not yet delivered. DISTRIBUTION.—Mains, 12 miles. Meters, 0. FINANCIAL.—Cap. Stock: Authorised, $500,000. MANAGEMENT.—Prest., Ed. M. Teal; Secy., Hugh McIlarney; Treas., C. W. Lynch; Supt., P. E. Leahy.

180. **LOWVILLE**, Lewis Co. (2,511.) Built in '94 by village. SUPPLY.—Springs, by gravity. Springs issue from foot hills of the Adirondacks 9 miles from and 287 ft. above village. RESERVOIRS.—Cap., 2,090,000 galls.. Collecting, at springs, 90,000; storage, 2,000,000; ½ mile north of village, for fire purposes only. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 19 miles. Taps, 463; made by village for $8, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters: 31; owned by consumers; controlled and repaired by village. Village can compel use of meter and any consumer may have one; compulsory for public buildings. Hydrants, 86. CONSUMPTION.—(Galls.) av., 250,000; max., 300,000; min., 200,000. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Cost, $103,000. Bonded debt, $98,000, at 3½%. MANAGEMENT.—Comrs.; Prest., R. J. Richardson; Secy., F. P. Kirley; Treas., V. L. Waters; Supt., D. E. Jones. Rept. by Supt., Dec. 18.

D 16. **LUZERNE**, Warren Co. (868.) Built in '93 by E. M. Garnar. Engr. and Contr., E. M. Garnar. Supplies Hadley. Co. is not exempt from local taxes and there is no compensation for public service. Supply, mountain spring, by gravity from impounding reservoir, about 3 miles distant. Mains, 5 miles. Taps, 150; made by owner. Services, iron; paid for by owner. Meters, 0; proprietor cannot compel use of meters, but any consumer may have one. Hydrants, private, 6. Pressure, ordinary, 130 lbs.; fire, 100 lbs. Cost, $26,000. Cap. Stock all paid-up; paid no div'd. Expenses, $525: Operating, $500; taxes, $25. Owner, E. M. Garnar, Sr. Rept. by E. M. Garnar, Aug. 14. No sewers.

181. **LYONS**, Wayne Co. (4,475.) Present works built in '87 by Lyons Water-Works Co.; first supplied in '77; domestic, only. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Davidson. Buckwheat coal used; av. cost, $2.80 per short ton, delivered. FILTER.—12-ft. charcoal. STAND-PIPE.—Cap., 117,500 galls.; 20 × 50 ft. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 9½ miles; cost extensions met by Co. Taps, 411. Services, w. i.; paid for by Co. Meters: 20; owned, controlled and repaired by Co. Use of meters compulsory for water motors and large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, 49. CONSUMPTION.—(Galls.) av., 350,000; max., 475,000; min., 275,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $50,000. Cap. Stock Authorized, $50,000; all paid-up. MANAGEMENT.—Prest., C. J. Ryan, 43 West 33d St., N. Y. City; Secy. and Supt., John J. Finigan; Treas., Danl. Moran; Ch. Pump. Engr., C. Berns. Rept. by Secy., July 11. PROJECTED IMPROVEMENTS.—Increase of supply; dug well. SEWERS.—Under construction. REFERENCE.—Eng. News, Mar. 18, '82.

D 17. **M'CONNELLSVILLE**, Oneida Co. (Est., 127.) Built in '93 by McConnellsville Water Co.; put in operation Dec. 1. No Engr. or Contr. Supply, Springs, by gravity. Fiscal year closed June 1. Mains, 1 mile. Taps, 25; made by Co.; paid for by consumer. Services, paid for by consumer. Meters, 0. Cost, $1,400. Cap. Stock: Authorized, $1,000; all paid up; paid 8% div'd. No debt. Prest., T. Chrestien; Secy., Lansing Tuttle; Treas. and Supt., A. B. Chrestien. Rept. by Treas., July 13. No sewers.

P 7½. **MADISON**, Madison Co. (390.) Feb. 23, '97, village voted to build works. Address W. Comrs.

182. **MALONE**, Franklin Co. (4,986.) Built in '57 by Malone Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay for hydrant rental. SUPPLY.—Springs in Adirondack Mts., by gravity to and from reservoir; fall from spring to reservoir 101 ft.; from reservoir to village, 8 miles, 225 ft. RESERVOIRS.—Cap., 2,000,000

galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, not given; cost extensions met by rentals. Services, iron and lead; paid for by property owner. Meters, 0. Hydrants, public, 72; private, 4. PRESSURE.—Ordinary, 90 lbs. One steam fire engine is used. FINANCIAL.—Cap. Stock: Authorized, $150,000. MANAGEMENT.—Prest., C. W. Breed; Secy. and Treas., N. M. Marshall; Supt., Geo. Sabin. Rept. by Supt., July 11. SEWERS.—Partially sewered. REFERENCE.—Eng. News, Feb. 18, '82.

183. **MAMARONECK,** Westchester Co. (2,385, town.) Built in '85 by Mamaroneck Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Mamaroneck River, pumping to reservoir. PUMPS.—Cap., 1,200,000 galls.; Worthington steam: 200,000 simple high pressure; 750,000 comp. cond.; 250,000 Holly hor. water power. Best anthracite furnace coal used; av. cost, $6 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; distributing; about 85 ft. above tide-water. FISCAL YEAR CLOSED Jan., '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by receipts. Services, paid for by consumer. Meters: 40; owned by Co.; repairs paid by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, 15. PRESSURE.—Ordinary, 80-ft. head. FINANCIAL.—Cost, $75,000. Cap. Stock: Paid-up, $25,000. Bonded debt, $50,000. Expenses: Operating, $4,000; taxes, $220. Revenue, $4,450: Consumers, $4,000; City, fire protection, none; street sprinkling, $450. MANAGEMENT.—Prest., James M. Constable; Secy. and Treas., Wm. T. Cornell; Supt. and Ch. Pump. Engr., Louis Ottmann. Rept. by Secy., July 13. SEWERS.—Partially sewered.

184, 185. **MANLIUS,** Onondaga Co. (942.)

VILLAGE PLANT.

Built in '94. Engr., E. D. Smalley, Syracuse. SUPPLY.—Springs, by gravity direct for domestic purposes; by gravity to reservoir for fire protection. Springs are about 1½ miles from village and (press rept.) are 236 ft. above bridge and 73 ft. above depot. RESERVOIR.—Cap., 700,000 galls. (press rept.) DISTRIBUTION.—Mains, 7 miles (press rept., Oct., '94). MANAGEMENT.—Comrs.: Prest., G. H. Tripp; Secy., F. M. Barnum.

G. W. H. WOOD'S PLANT.

Built prior to '17 by private parties. Supply, Springs by gravity. One-half mile of pipe supplies 19 families, 4 hydrants and 13 fire cisterns. Address G. W. H. Wood. NOTE.—No report since '90-1 Manual.

186. **MARGARETTVILLE,** Delaware Co. (616.) Co. incorp. in '85. FRANCHISE.—Village to pay $225 per yr. for 21 hydrants. SUPPLY.—Not given. RESERVOIR.—Cap., 392,700 galls.; 258 ft. above main street. Hydrants, 21. PRESSURE.—Ordinary, 78 to 120 lbs. FINANCIAL.—Cost, $13,000. Cap. Stock: Paid-up, $10,000; paid two 4% div'ds in last two years. Debt, $400. Revenue, $700. City, fire protection, $225. MANAGEMENT.—Prest., A. Albers; Secy., C. C. Kaufman; Supt., E. L. O'Conner. Rept. by T. Winter, Director, Sept. 29.

187. **MARLBORO,** Ulster Co. (870.) Built in '94 by Marlboro Water-Works Co.; put in operation Dec. 19, '94. Engr., David H. Merritt, Highland. Contr., John Marsden, Utica. FRANCHISE.—50 yrs. from '93; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay only for fire hydrants, $500 first yr., $800 second yr., $1,000 yearly thereafter. SUPPLY.—Springs (by gravity?). RESERVOIR.—Cap., 3,500,000 galls.; storage and distributing, 3 miles from city. Press rept. states reservoir is formed by masonry dam, 105 ft. long, 23 ft. high. FISCAL YEAR CLOSED Mar. 22. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by Co. Taps, 75; made by Co. for 75 cents for ½-in. Services, galv. i.; paid for by consumer. Meters: 2; owned, controlled and repaired by Co.; yearly rental, $2.50. Use of meters will be made compulsory for all consumers within a year. Co. can compel use of meters and any consumer may have one. Hydrants, 45. CONSUMPTION.—(Galls.) av., 40,000; max., 60,000; min., 20,000. PRESSURE.—Ordinary and fire, 40-175 lbs. FINANCIAL.—Cost, $52,000. Cap. Stock: Authorized, $26,000; all paid-up; no div'd last yr. Bonded debt, $26,000, at 5%; due in 1923. Expenses, $1,900: Operating, $500; int., $1,300; taxes $100. Revenue: Consumers, unmetered, $820; City, fire protection, $1,000; other purposes, $400. MANAGEMENT.—Prest., O. B. Whitney, N. Y. City; Vice-Prest., Henry W. Millar, Utica; Secy., E. Dayton; Treas. and Supt., E. E. McNamee. Rept. by Treas., June 10. PROJECTED IMPROVEMENTS.—Dam is being raised 2 ft. SEWERS.—None.

105. **MATTEAWAN,** Dutchess Co. (4,278.) See Fishkill.

188. **MAYVILLE,** Chautauqua Co. (1,164.) Built in '93 by village. Engr., E. Delavan Smalley, Syracuse. Contrs., Chandler Bros., Beaver Falls, Pa. SUPPLY.—Ten 3-in. driven wells, 22 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,100,000 galls.; Buffalo: 600,000 dup. high pressure; 500,000 dup. comp. STAND-PIPE.—Cap., 42,000 galls.; steel, 12 × 50 ft.; built by Erie (Pa.) Boiler Works. DISTRIBUTION.—Mains, 4 miles. Services, w. i. Meters, 22. PRESSURE.—75 to 110 lbs. FINANCIAL.—Cost, about $18,000. Rept. by E. D. Smalley, Jan. 26, '97.

189. **MECHANICSVILLE,** Saratoga Co. (2,679.) Built in '93 by village; put in operation Nov., '93. Engr., P. H. Baermann, Troy. Contrs., Gray & Temple, Lansingburgh. SUPPLY.—Plum Brook, by gravity from impounding reservoir. DISTRIBU-

TION.—Mains, 12 miles; cost extensions met by direct tax. Taps, 315; made by Supt. for $1. Services, lead and galv. i.; paid for by owner. Meters: 135; owned and repaired by consumer; controlled by village. Any consumer may have meter. Hydrants, public, 50; private, 8. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $140,000. Bonded debt, $23,000, at 4%; due 1912; $30,000, at 4%; due 1917; $52,000, at 4%; due 1922; and $35,000, at 5%; due 1903. Expenses, $7,450: Operating, $1,500; int., $5,950. Revenue, $5,324, from all sources. MANAGEMENT.—Prest., Hiram B. Mace; Secy. and Treas., Wm. H. Allen; Supt., John Cavanagh. Rept. by N. T. Bryan, June 10. SEWERS.—Has sanitary sewers.

190. **MEDINA,** Orleans Co. (4,492.) Built in '93 by Medina Water-Works Co.; put in operation Mar. 17 (see note under Brockport). Engr., J. Nelson Tubbs, Rochester. Contrs., Bauer, Bruff & Ross. In '60 village built works for fire protection. FRANCHISE.—Provides for purchase of works by city or else renewal of franchise. City to pay $3,640 for public service, at rate of $50 per hydrant; contract for five years. SUPPLY.—Wells, pumping to reservoir and stand-pipe. PUMPS.—Cap., 2,000,000 galls; 2—1,000,000 Snow comp. Bituminous coal used; av. cost, $2.35 per short ton. RESERVOIR.—Cap., 1,000,000 galls. STAND-PIPE.—Cap., 260,000 galls.; 20 × 110 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 14 miles; cost extensions met by earnings. Taps, 600; made by Co., free. Services, iron; paid for by Co. Meters: 200; owned and repaired by consumer; controlled by Co.; yearly rental, $8. Co. can compel use of meters and any consumer may have one. "Compulsory for rates over $5." Hydrants, public, 92; private, 2. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 60 lbs.; fire, 68 lbs. FINANCIAL.—Cost, $160,000. Cap. Stock: Authorized, $110,000; all paid-up. Floating debt, $10,000; Bonded, $110,000, at 6%, due in 1910. No sinking fund. Expenses, $8,700: Operating, $1,500; int., $6,600; taxes, $600. Revenue, $9,640: Consumers, unmetered, $6,000; City, fire protection, $3,640. MANAGEMENT.—Prest., H. N. Smith, Boston; Secy., E. A. Bradley, Seneca Falls; Treas., Wm. F. Ross, Rochester; Supt., F. M. Dingledine; Ch. Pump. Engr., B. D. Hood, Knowlesville. Rept. by Treas., Dec. 20. SEWERS.—Has sanitary and storm sewers.

D 18. **MERRICK,** Queens Co. (Est., 125.) Small domestic plant built in '96 by Merrick Water Co., incorp. with $5,000 authorized cap. stock. Secy., E. C. Camman.

191. **MIDDLEBURG,** Schoharie Co. (1,139.) Built in '94 by Middleburg Water Co. Engr., J. Warren Lamb, Cooperstown. FRANCHISE.—Perpetual; with option of purchase of works by city within 5 yrs. from '94. City to pay $700 per annum for 25 hydrants. LEGAL DIFFICULTIES.—None. SUPPLY.—Stoney Brook, by gravity. RESERVOIR.—Cap., 143,000 galls.; distributing. FISCAL YEAR CLOSED Nov. 1, '96. DISTRIBUTION.—Mains, 4¾ miles. Taps, 75; made by Co. for $7. Services, galv. i.; paid for by property owner. Use of meters optional with Co. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Expenses: Operating, $250. MANAGEMENT.—Prest., A. H. Clark, Cooperstown; Secy. and Treas., J. Warren Lamb, Cooperstown; Supt., J. C. Borst. Rept. by Secy., Jan. 11, '97.

192. **MIDDLETOWN,** Orange Co. (11,977.) Built in '67 by village. SUPPLY.—Springs and surface water, pumping from impounding reservoir. Drainage area (press rept.), 841 acres. PUMPS.—Cap., 1,690,000 galls.; Deane comp. dup. added in '92. (A 1,500,000-gall. Blake and 2,000,000 Holly hor. water power and 500,000 Worthington comp. non-cond. rept. by respective makers.) RESERVOIRS.—Cap., 600,000,000 galls.: Old: 250,000,000; area, 86 acres. New: 350,000,000; area, 110 acres; built 8,500 ft. from and 80 ft. above old reservoir. FISCAL YEAR CLOSED Feb. 1, '96. DISTRIBUTION.—Mains, 26½ miles; cost extensions met by rentals. Taps, 1,863; made by city for $2. Services paid for by property owner. Meters: 127; owned and controlled by city; repairs paid by owner. Use of meters optional with city. Hydrants, public, 220; private, 20. CONSUMPTION.—(Galls.) av., 1,800,000. PRESSURE.—Ordinary, 40 to 90 lbs. FINANCIAL.—Bonded debt, $197,000, at 3½%; $64,000, at 4%. Sinking Fund: $2,000, deposited in bank. Expenses, $19,400: Operating, $9,932; int., $9,468. Revenue, $17,263: Consumers, unmetered, $15,331; metered, $916; building purposes, $100; other purposes, $916. MANAGEMENT.—Prest., A. V. Boak; Clk., D. F. Seward; Supt., I. F. Van Duzer. Rept. by Clk., Oct. 29. SEWERS.—Has sewers. REFERENCE.—Eng. News, Oct. 14, '82.

193. **MIDDLEVILLE,** Herkimer Co. (Est., 680.) Built in '95-6 by village. Engr., Herschel Roberts. Contrs., Driscoll Bros. & Reed, Ithaca. SUPPLY.—Brook and springs, by gravity. RESERVOIR.—Cap., 25,000,000 galls.; storage, area, 9 acres; 378 ft. above town. Press rept., Apr. 28, '96, states that supply main is 8 ins. in diam., and that pressure reducing valve is placed at a point halfway in its length. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3 miles. Taps, 80; made by city for $1. Services, lead; paid for by consumer. Village can compel use of meters and any consumer may have one. Hydrants, public, 25; private, 1. PRESSURE.—Ordinary, 90 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $27,424. Bonded debt, $20,000, at 3½%. Revenue, $750: Consumers, unmetered, $500; City, fire protection, $250. MANAGEMENT.—Prest., C. W. Hamlin; Secy., W. H. Dickins; Treas., Frank M. Molineux. Rept. by Treas., in June. SEWERS.—Has a partial system for storm water.

194. **MILFORD,** Otsego Co. (2,051.) Built in '93 by village; put in operation Oct., '93. Engr. and Contr., J. Warren Lamb, Cooperstown. SUPPLY.—Brook, by gravity. FILTER.—Constructed under bed of brook. Ground excavated to hard bottom and bot-

tom covered with sewer pipes laid with open joints; these pipes are all led to a small well, from which water is taken to distributing reservoir; remainder of excavation is refilled with stone and gravel. A cross-wall is built below the filter-bed to dam back the summer flow. (Rept. on filter from Engr.) RESERVOIR.—Cap., 269,300 galls.; formed by masonry dam, 80 ft. long, 8 ft. high. DISTRIBUTION.—Mains, 6 miles. Taps, 120; made for 75 cts. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, 30. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $14,400. Bonded debt, $14,400, at 4%. Expenses: Operating, about $50. Expenses and interest in '96 met by rental of water. Deficit in '93 and '94 about $200, carried by village notes. MANAGEMENT.—Prest., Chas. S. Barney; Secy., C. B. Kinokern; Treas. and Supt., Austin Cronkhite. Rept. by C. S. Barney, July 13. SEWERS.—None.

195. **MILLERTON,** Dutchess Co. (638.) Built in '91 by village; put in operation July 1. SUPPLY.—Springs, by gravity; pumping for dry season and emergency. PUMPS.—Cap., 360,000 galls.; Knowles. Bituminous coal used; av. cost, $4.45 per short ton. RESERVOIR.—Cap., 500,000 galls.; storage. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 4 miles. Taps, 107; made by village. Services, galv. i.; paid for by property owner. Meters: 2; owned by village. Hydrants, 26. PRESSURE.—Ordinary, 75 to 90 lbs. FINANCIAL.—Cost, $19,000. Bonded debt, $18,000, at 4%. MANAGEMENT.—Prest., F. A. Hotchkiss; Secy., Wm. Trafford; Treas., Geo. Kistlebrock; Supt., P. N. Paine; Ch. Pump. Engr., F. D. Traver. Rept. by Supt., Nov. 16. SEWERS.—None.

196. **MOHAWK,** Herkimer Co. (1,806.) Built in '90-91 by village; put in operation Jan. 22, '91. SUPPLY.—Boiling spring, 15 ft. in diam. and cased with iron below clay, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Gordon dup. Eureka bituminous coal used; av. cost, $2.80 per short ton. STAND-PIPE.—Cap., 75,000 galls.; iron; 16 × 50. ft., on stone foundation. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by village and income. Taps, 325; made by village. Services, ¾-in. galv. i.; paid for by village to curb. Meters: 6; owned, controlled and repaired by village. Use of meters compulory for factories. Consumers may only have one in special cases. Hydrants, public, 49; private, 2. CONSUMPTION.—(Galls.) av., 100,000; max., 150,000. PRESSURE.—Ordinary, 75-98 lbs. One steam fire engine is used. FINANCIAL.—Cost, $35,000. Bonded debt, $32,000, at 4%; due 1910. Expenses: Operating, $1,500. Revenue, $4,320: Consumers, $3,000; City, fire protection, $1,320. Deficits met by taxation, but are none now. MANAGEMENT.—Prest., Albert H. Day; Secy., Chas. C. Steele; Treas., Warren Ramsey; Supt. and Ch. Pump. Engr., Oscar Horton. Rept. by Treas., Aug. 13. PROJECTED IMPROVEMENTS.—1,000,000 comp. dup. steam pump. SEWERS.—Has small sanitary and storm sewer system.

197. **MOHONK LAKE,** Ulster Co. (Not given.) Built in '93 by Albert K. Smiley; put in operation June 1, '93. SUPPLY.—Lake by pumping. PUMPS.—Two Worthington, dup. Anthracite stove coal used; av. cost, $6 per short ton, delivered. RESERVOIRS.—Cap., 1,050,000 galls.; two distributing, 180 ft. above lake; 50,000 and 1,000,000. DISTRIBUTION.—Mains, 1 mile. Taps, 135. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 97 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Albert K. Smiley, Aug. 27.

198. **MONROE,** Orange Co. (630.) Built in '95 by village; put in operation Oct. 15, '95. Engr., Fred J. Knight. Contr., E. B. Kay. SUPPLY.—Lake Mombasha, by gravity. FISCAL YEAR CLOSED June 15. DISTRIBUTION.—Mains, 8 miles. Taps, 51; made by plumber for $2. Services, lead; paid for by owner of property. Meters: 4; owned and controlled by village. Use of meters compulsory for farmers and florists. Village can compel use of meters and any consumer may have one. Hydrants, public, 40; private, 2. PRESSURE.—Ordinary, 106 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 4%; due in 1926. MANAGEMENT.—Prest., Gilbert Carpenter; Secy., G. R. Conklin; Treas., Henry Mapes. Rept. by Prest., June 19. SEWERS.—None.

199. **MONTGOMERY,** Orange Co. (1,024.) Built in '95 by village; put in operation Dec. 1, '95. Engr., Alex. Potter, 137 Broadway, N. Y. City. SUPPLY.—Well, 32 × 16 ft., pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; Worthington comp. non-cond. Buckwheat coal used; av. cost, $2.75 per short ton. STAND-PIPE.—Cap., 158,000 galls.; 16 × 100 ft., steel, on granite foundation, 12 ft. deep, 26 ft. in diam. at bottom, 18 ft. at top. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general fund in hands of the board. Taps, 58; made by Supt. for $3. Services, lead or galv. i.; paid for by property owner. Meters, 0. Use of meters optional with village; compulsory for hotels. Hydrants, 32. CONSUMPTION.—(Galls.) av., 19,000; max., 21,000; min., 17,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $23,600. Bonded debt, $23,000, at 4%; due July 1, 1915; $2,000, at 4%; due Jan. 1, 1906. No sinking fund. Expenses: Operating, not known; int., $460. Revenue: Consumers, $500. Deficits: A requisition of $1,400 was made for taxation in '96. MANAGEMENT.—Prest., C. Brooks; Secy., A. Patchell; Supt., Lyman H. Taft; Ch. Pump. Engr., John Baildon. Rept. by Supt., June 10. SEWERS.—None.

200. **MONTICELLO,** Sullivan Co. (1,016.) Built in '95 by village; put in operation Nov. 8. Engr., John A. Miller, Goshen. Contr., L. E. Minor, 31 Bway., New York City. SUPPLY.—Pleasant Lake, pumping to stand-pipe. PUMP.—Dup. comp. cond. Anthracite pea coal used; av. cost, $3.00 per short ton. STAND-PIPE.—Cap., 250,000

galls.; iron; 25 × 60 ft. DISTRIBUTION.—Hydrants, 35. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $27,000. Expenses, int., $660. MANAGEMENT.—Prest., D. S. Avery; Secy., M. La Tourette. SEWERS.—None.

P 8. **MONTOUR FALLS,** Schuyler Co. (Not given.) In '96 it was reported that a franchise for water-works and electric lights had been granted to E. A. Dunham & Co., of Montour Falls.

201. **MORAVIA,** Cayuga Co. (1,466.) Built in '84 by Moravia Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs, by gravity. RESERVOIR.—(In '89) Cap., 150,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 4 miles. Taps, 90. Hydrants, 30. CONSUMPTION.—(Galls.) av., 64,000. PRESSURE.—Ordinary. 86 lbs. FINANCIAL.—Cost, $36,000. Cap. Stock: Authorized, $30,000; all paid-up. Bonded debt, $20,000, at 6%. Expenses, $1,365: Operating, $100; int., $1,200; taxes, $65. Revenue, $2,100: Consumers, $1,200; City, $900. NOTE.—No report since '90-1 Manual.

202. **MORRIS,** Otsego Co. (601.) Built in '95 by village; put in operation in Aug. Engr., J. Warren Lamb, Cooperstown. SUPPLY.—Mountain brook, by gravity to and from reservoir. RESERVOIR.—Cap., 100,000 galls.; masonry; covered. DISTRIBUTION.—Mains, 3½ miles. Taps, 100; made by village, free. Services, galv. i.; paid for by property owner. Hydrants, 28. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 68 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $13,000, at 4%. Expenses: Operating, $100. MANAGEMENT.—Comrs. Rept. by J. Warren Lamb, Engr., Dec. 18.

203. **MORRISVILLE,** Madison Co. (726.) Built in '95 by village. Engrs., Stanwix Engineering Co., Rome. Contrs., Beckwith & Quackenbush, Herkimer. MANAGEMENT.—Prest., A. M. Holmes; Secy., D. D. Jones; Treas., L. W. Burroughs. Rept. by Jno. Reilly, Sept. 4, '96.

204. **MOUNT MORRIS,** Livingston Co. (2,286.) Built in '79 by Mills Water-Works Co. FRANCHISE.—30 yrs.; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Nine springs, by gravity to and from reservoir. Springs crop out in area of 30 acres of fine sand, at base of hills of sandy loam; springs collected by tile drains and conducted to settling wells, thence to a larger collecting well; ¾ miles of 4-in. pipe leads water from the latter to reservoir. RESERVOIR.—Cap., 800,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 584. Meters, 15. Hydrants, 28. CONSUMPTION.—(Galls.) av., 70,000. PRESSURE.—Ordinary (in '89), 45 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock: Authorized, $60,000; all paid-up. No debt. Revenue: City, $1,120. MANAGEMENT.—Prest. and Supt., M. H. Mills; Secy., Carlos Branch. Rept. by Supt., July 22. REFERENCE.—Eng. News, Apr. 12, '84.

F 1. **MOUNT UPTON,** Chenango Co. (Est., 605.) Built in '94 by C. G. Brooks. Engr. and Contr., C. G. Brooks. Supply, mountain spring, by gravity. Reservoir, cap., 25,000 galls. Collecting and distributing; 24 × 24 ft., × 6 ft. deep; covered. Fiscal year closed Jan. 1, '96. Mains, 1¼ miles; cost extensions met by rentals. Taps, 76; made by owner of works, free. Services, ½-in. galv. i., paid for by consumer. Meters, 0. Hydrants, private, 10. Pressure, 160 lbs. Cost, about, $4,000. Expenses, not kept. Revenue, consumers, unmetered, $425. Rept. by owner, Dec. 19. Projected improvements, additional reservoir. No sewers.

206. **MOUNT VERNON,** Westchester Co. (10,830.) Built in '86 by New York & Mt. Vernon Water Co., now known as the New York Suburban Water Co. Domestic works introduced in '83-4; bought by present Co. and abandoned. FRANCHISE.—(Original) 20 yrs. SUPPLY.—Tom Paine Brook and Hutchinson River, pumping from impounding reservoir to stand-pipe. PUMPS.—Cap., 6,500,000 galls; Worthington hor. comp. high duty, 4,500,000, and Deane, 2,000,000. El Mora semi-bituminous coal used; av. cost, $3.16 per short ton. FILTERS.—Cap., 5,000,000 galls; intermittent sand. RESERVOIRS.—Cap., 135,000,000 galls; impounding: Two on Tom Paine Brook, 90,000,000, and 4,000,000; Hutchinson River, 20,000,000; Hugenot Lake, 21,000,000. STAND-PIPE.—Cap., 290,000 galls.; 20 × 125 ft.; raised and lengthened in '92. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 43 miles. Taps, 2,889; made by Co., free. Services, galv. i.; paid for by property owner. Meters, 200; controlled by Co.; repairs paid by consumer. Use of meters compulsory for houses with more than one apartment. Hydrants, public, 361; private, 3. CONSUMPTION.—(Galls.) av., 1,750,000; max., 2,250,000; min., 1,500,000. PRESSURE.—Ordinary, 104 lbs. One steam fire engine for emergency only. FINANCIAL.—All withheld. MANAGEMENT.—Prest., Newman Erb; Secy. and Treas., Costello Lippitt. Rept. by Genl. Mgr., G. E. Hoffmaster, Aug. 12. PROJECTED IMPROVEMENTS.—Raising dam on Tom Paine Brook to obtain a storage of 197,000,000 galls. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 6, '85; siphon, May 4, '93, illus.; sand filtration, Aug. 23, '94, illus. and inset.

207. **NAPLES,** Ontario Co. (1,266.) Built in '95 by village; put in operation in Dec. Engrs., Voorhees & Witmer, Buffalo. Contr., Geo. S. Miller, Council Bluffs, Ia. RESERVOIR.—Cap., 1,000,000 galls; storage and distributing; 150 ft. above, one mile from village. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by general taxation. Taps, 160; made by village for $5. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 59; private, 34. PRESSURE.—95 lbs. FINAN-

CIAL.—Cost, $23,000. Bonded debt, $23,000, at 4½%; due in 1915. No sinking fund. Expenses: Operating, $65; int., $1,035; taxes, $1,035. Revenue: Consumers, unmetered, $673; city, street sprinkling, $40; public buildings, $15. MANAGEMENT.—Prest. and Treas., D. H. Maxfield; Secy., C. S. Lincoln; Supt., Wm. Parr. Rept. by W. T. Webb, Jan. 12, '97. SEWERS.—None.

208. **NEWARK,** Wayne Co. (2,824.) Built in '78 by Newark Water-Works Co. FRANCHISE.—Provides for purchase of works by city at intervals of 5 yrs. Rates are fixed in franchise. SUPPLY.—Springs, pumping from collecting reservoir to standpipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington; high and low pressure. Bituminous coal used; av. cost, $2.66 per short ton. RESERVOIRS.—Cap., 1,250,000 galls. STAND-PIPE.—Cap., 120,320 galls.; 16 × 80 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by Co. Taps, 225; made by Co., for $3. Services, galv. i.; paid for by consumer. Meters: 50; owned by consumer; controlled and repaired by Co.; yearly rental, $3.65. Use of meters compulsory for motors. Co. can compel use of meters and any consumer may have one. Hydrants, public, 84; private, 13. CONSUMPTION.—(Galls.) av., 320,000; max., 420,000; min., 290,000. PRESSURE.—Ordinary, 60 lbs.; fire, 65 lbs. FINANCIAL.—(In '88.) Cost, $120,000. Cap. Stock, $100,000. Debt, $93,000, at 6%. Expenses: Operating, $1,500. Revenue, $4,600; City, fire protection, $2,500. MANAGEMENT.—Prest., A. M. Whitney; Secy. and Treas., F. B. Roblin; both of 15 Wall St., N. Y. city; Supt., H. A. Gardner. Rept. by Secy. SEWERS.—None.

209. **NEW BERLIN,** Chenango Co. (979.) Built in '85 by village. SUPPLY.—Springs, by gravity, from impounding reservoir. RESERVOIRS.—Cap., 13,008,000 galls.; storage, 13,000,000, and also small reservoir, 8,000. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by revenue and taxation. Taps, 177; made by village, at consumer's expense. Services, galv. i.; paid for by consumer. Meters, 2; owned, controlled and repaired by village. Use of meters optional with village. Hydrants, 30. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 100 to 125 lbs. FINANCIAL.—Cost, about, $40,000. Bonded debt, $36,000, at 4%; due in 20 yrs. Expenses, $1,475: Operating, $31; int., $1,444. Revenue, $2,100. Water rents, $500 in excess of maintenance and interest chargings, excluding extensions. MANAGEMENT.—Village Trustees. Prest., Henry Lottridge; Treas., F. E. Holmes; Supt., H. McGuire. Rept. by Act. Secy., Chas. J. Pratt, June 5. SEWERS.—None.

210. **NEW BRIGHTON AND PORT RICHMOND,** Richmond Co. (New Brighton, 16,423; Port Richmond, 6,290.) Built in '80-1 by Staten Island Water Supply Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City pays for public service, under contracts running five years. Press rept., Jan. 7, '97, states that contract expired in Apr., '95, and had not been renewed. SUPPLY.—Driven wells, which siphon into large receiving wells, pumping direct and to reservoir. PUMPS.—Cap., 8,000,000 galls.; 1,000,000 and 2,000,000 Knowles and 5,000,000 Holly-Gaskill hor. high duty. Anthracite pea coal used; av. cost, $2.75 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; distributing. DISTRIBUTION.—Mains, 57 miles. Taps, 3,700; made by Co., for $3.50. Services, lead and galv. i.; paid for by consumer. Meters, 50; owned by consumer. Use of meters optional with Co. Hydrants, about 500. CONSUMPTION.—(Galls.) av., 4,000,000; max., 5,000,000; min., 3,400,000. PRESSURE.—Ordinary, 140 lbs.; fire, 145 lbs. Steam fire engines are used. FINANCIAL.—Withheld, except taxes, $6,000. MANAGEMENT.—Prest., H. Brightman; Secy., H. I. Brightman; Treas., H. L. Horton; Supt., J. S. Warde. Rept. June, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Mar. 18, '82.

211. **NEWBURGH,** Orange Co. (23,087.) Built in '53 by town. SUPPLY.—Washington Lake and Silver Creek, by gravity and pumping to reservoir. When full Washington Lake has area of 140 acres and is 276 ft. above Hudson River; drainage area about 600 acres. Silver Creek is connected with lake by 24-in. cement pipe line, 1,874 ft. long; drainage area about 10,000 acres. CONDUITS.—(In '89.) From lake 3,128 ft. of 24, and for remaining distance 20-in. pipe leads to city. Also from natural outlet of lake 15-in. cem. and 18-in. vitrified stoneware pipe extends 2,000 ft. to natural subterranean passage, ¾ miles long, called Swallow Hole, and ending in Trout-hole reservoir. From here 15,200 ft., of 12-in. pipe connects with other conduit at city; two conduits are also connected near reservoirs. PUMPS.—Cap., 1,500,000 galls.; Worthington comp. non-cond. (2—1,500,000 Worthington simple high pressure rept. by makers.) Anthracite pea coal used; av. cost, $3.40 per short ton. RESERVOIRS.—Cap., 2,000,000 galls. Trout-Hole: 44 ft. below lake and 282 ft. above Hudson. High Service: Cap., 2,000,000; 55 ft. above Washington Lake, 101 ft. above Trout-hole reservoir and 331 ft. above Hudson. DISTRIBUTION.—Mains, 33 miles (including 9 miles supply mains from lakes); cost extensions met by yearly assessments. Taps, 4,500; made by city. Services, lead; paid for by property owner. Meters, 0. Hydrants, public, 343; private, 3. CONSUMPTION.—(Galls.) av., 3,500,000. PRESSURE.—Ordinary and fire, 50 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,850,000. Bonded debt, $463,000: $20,000, at 3%, due 1906; $80,500, at 3½%, due 1898-1925; $270,500, at 4%, due 1898-1915; $77,000 at 5%, due '97; $15,000, at 6%, due '96. Sinking Fund: $2,000 to $5,000 of bonds, paid annually. Expenses, $32,987: Operating $14,000; int., $18,987. Revenue: Consumers, $41,901; tapping

mains, $1,458. MANAGEMENT.—Water Comrs. Prest., Jas. H. Case; Secy. and Supt., C. Stanton; Treas., Jas. N. Dickey; Ch. Pump. Engr., J. E. Lane. Rept. by Water-Works, June 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 20, '81.

212. **NEW DORP,** Richmond Co. (400, est.) Built in '89 by South Shore Water Co., of Staten Island; purchased by C. A. Frieburgh. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 250,000 galls.; Worthington. STAND-PIPE.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 3 miles. FINANCIAL.—Cap. Stock: Authorized, $20,000; all paid-up. Bonded debt, $1,200. NOTE.—No report since Aug. 1, '91.

D 19. **NEW HARTFORD,** Oneida Co. (912.) Built in '95 by Co. for domestic supply only; put in operation in Nov. Engr., Arthur M. Scripture. No contr. No arrangement with town for public service. Supply, streams and springs, by gravity. Reservoirs, cap., 5,000,000 galls.; impounding, 4,000,000; distributing, 1,000,000. Mains, 2½ miles. Taps, 45. Services, galv. i. or lead, paid for by property owner. Meters, 2; owned by consumer. Use of meters compulsory for factory. Co. can compel use of meters and any consumer may have one. Pressure, 80 lbs. Cap. Stock, $100,000. Prest., I. N. Terry; Secy. and Treas., C. Lansing Jones, both of Utica. Rept. by Prest., Dec. 18. Note.—Pipes have been laid with 40 Ts for placing hydrants when village shall have made an appropriation for that purpose for fire protection.

213. **NEW PALTZ,** Ulster Co. (935.) Built about '92 by New Paltz Water-Works Co. SUPPLY.—By gravity, from two reservoirs, through 10-in. main. FINANCIAL.—Cap. Stock, $25,000. Bonded debt, $25,000. Above from press repts. in '92.

214. **NEWPORT,** Herkimer Co. (659.) Built in '90 by village. Engr., Albert Weber, Herkimer. Contr., H. W. Dexter. SUPPLY.—Springs (by gravity?) RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by rentals. Taps, 150; made by consumer. Services, iron; paid for by owner. Meters, 0. Hydrants, 6. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $10,000, at 4%. Expenses: Operating, $50. MANAGEMENT.—Prest., V. H. Hume. Secy. and Supt., D. P. Wooster. SEWERS.—None.

215. **NEW ROCHELLE,** Westchester Co. (8,217.) Built in '85-7 by New Rochelle Water Co. Supplies towns of New Rochelle, East Chester and part of Pelham. Town of East Chester includes villages of Tuckahoe, Waverly and Bronxville. FRANCHISE.—Provides for purchase of works by city. Rates are subject to regulation by city. SUPPLY.—Hutchinson River, by gravity from two impounding reservoirs and by pumping from artesian well to lower reservoir and from reservoirs to stand-pipes. PUMPS.—Cap., 7,170,000 galls.; 4 Worthington: one 2,000,000 comp. cond. and one 3,500,000 hor. comp. high duty; 500,000 and 1,000,000 non-comp. non-cond., as reserve. Knowles: Also 170,000 Knowles artesian well pump. RESERVOIRS.—Cap., 318,000,000 galls. Impounding: No. 1, or upper: 271,000,000 galls; 174 ft. above sea level; drainage area, 1,200 acres. No. 2, or lower: 47,000,000; 90 ft. above sea level; fed by overflow from upper reservoir and by its own drainage area of 900 acres. Also supplied by pumping from an artesian well yielding 170,000 galls. daily. STAND-PIPES.—Two; one 140 ft. high, elev. 241 ft. and one 50 ft. high, elev. 291 ft. DISTRIBUTION.—Mains, 60 miles. Taps, 1,788. Services, lead. Meters, 1,788. Use of meters compulsory for all consumers. Hydrants, 186. CONSUMPTION.—(Galls.) av., 126,500,000. PRESSURE.—Ordinary, 30 to 70 lbs. FINANCIAL.—Cost, $1,500,000. Cap. Stock, $80,000. Debt, $1,420,000, due to directors, who own all the stock. Expenses: Operating, $27,849; taxes, $4,121. Revenue: New Rochelle, fire protection and sewer flushing, $4,500; East Chester, fire protection, $1,500. MANAGEMENT.—Rept. by Supt., F. H. Davis, Dec. 15, '96.

216. **NEWTOWN** (P. O., Corona?) Queens Co. (17,549.) Built in '93-4 by Citizens' Water Supply Co.; put in operation June 8, '94. Engr., G. A. Roullier, Flushing. Contrs., Pease Bros., Flushing, and J. J. Phillips, Long Island City. Works supply whole town, comprising seven villages, four of which are Corona, Middle, Winfield and Woodside. FRANCHISE.—Unlimited. City to pay $25 a yr. each for first 100 hydrants, $20 for second 100 and $18 a yr. for all over that number; 10-yr. contract from '94. SUPPLY.—15 4-in. driven wells, pumping to stand-pipe. PUMPS.—Cap., 5,750,000 galls.; 4 Worthington: comp. cond., 750,000 and 1,000,000; 2—2,000,000 6-cylinder triple exp. (these not mentioned by Supt., but rept. by makers). Anthracite egg coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 183,600 galls.; 25 × 50 ft., iron; built by R. D. Wood & Co., Phila., Pa. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, about 42 miles, 14 to 4 in. c. i.; cost extensions met by capital stock. Taps, 1,065; made by Co. Services, lead-lined iron; paid for by consumer. Meters, 900; owned by consumer and repaired by Co. Use of meters compulsory for all consumers. Hydrants, public, 338; private, 16. CONSUMPTION.—(Galls.) av., 300,000; max., 375,000; min., 225,000. PRESSURE.—Ordinary, 60 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $175,000. Cap. Stock: Common, authorized, $175,000; all paid-up. Bonds: Authorized, $150,000; issued, $100,000. Expenses: Operating, $9,000. Revenue: Consumers, $8,000; City, fire protection, $6,000. MANAGEMENT.—Prest., Cord Meyer, Jr., 62 William st., New York; Secy., Aug. Rapalyea, Elmhurst; Treas., John E. Backus. Rept. by Supt., Wm. F. Clapton, Elmhurst, Jan. 26, '97. PROJECTED IMPROVEMENTS.—About 4 miles of pipe is to be laid. SEWERS.—None.

217. **NEW YORK,** New York Co. (1,515,301.) First supplied in 1776; Manhattan Company built works about 1799. Present works built in '42 by city. SUPPLY.—Drainage areas of Croton, Bronx and Bryam rivers, by gravity from storage and impounding to receiving and distributing reservoirs, with repumping for high service. Croton drainage area, above Croton dam, 338.82 sq. miles; Bronx and Bryam drainage area, above Kensico Reservoir, 22 sq. miles. AQUEDUCTS.: Old Croton: Originally extended from Croton Lake to reservoirs in Central Park, 38.1 miles, with total fall of 43.7 ft., or 1.1470 ft. per mile. In '65 portion below 92d St. was replaced by two 72-in. c. i. pipes, which in turn have been replaced by three 48-in. pipes; and in '70-5, ¾ mile within city was replaced by six lines of 48-in. c. i. pipe. Aqueduct of masonry, brick lined, with sectional area of 53.34 sq. ft., was designed for daily capacity of 72,000,000 galls., but carried about 95,000,000 galls. just before completion of new aqueduct. New Croton Aqueduct: Put in use July 15, '90; extends from Croton Lake to 135th St., where it changes to 12 lines of 48-in. c. i. pipe, 4 each connecting with old aqueduct, Central Park reservoir and city distribution. Length of aqueduct, 30.75 miles, and of pipe to reservoir, 2.35 miles, making total length of 33.10 miles. Has dy. cap. in round numbers of 300,000,000 galls. to point near Jerome Park reservoir site, where branches are to be taken off; cap. thence about 250,000,000 galls. Cross-sectional area above Jerome Park reservoir, 155.5735 sq. ft. Bronx River Conduit: 15.2 miles 48-in. pipe to Williamsbridge reservoir, and 2½ miles of 36-in. pipe around reservoir to Jerome Ave. PUMPS.—Cap., 59,000,000 galls. Worthington: 2—7,500,000 comp. cond.; two hor. comp. high duty, 10,000,000 and 6,000,000. Blake: 2—10,000,000 and 2—4,000,000. Egg anthracite coal used; av. cost, $4.25 per short ton. RESERVOIRS.—Cap., 39,350,000,000 galls.; 13 storage reservoirs in drainage area, 38,000,000,000; 5 distributing reservoirs in city, 1,850,000,000. On completion, New Croton and Jerome Park reservoirs will have storage cap. of 75,000,000,000 galls. New Croton dam will impound 32,000,000,000 galls.; partly masonry and partly earth dam; total length 1,650 ft., 260 ft. high above footing courses and 163 ft. above natural bed of river. Main dam is 200 ft. thick at bottom and 22 ft. at top. Jerome Park reservoir will have cap. 1,800,000,000; area, 300 acres, in excavation and embankment; max. height of embankment, 36 ft.; 20 ft. wide at top. STANDPIPES.—Cap., 63,450 galls.; two, each 6 × 150 ft.; one of wrought iron; the other of mild steel. TANK.—Cap., 33,068 galls.; 16 × 22 ft., on masonry tower, 150 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 750 miles; cost extensions met by appropriations from taxation for small mains, by bonds for large mains. Taps, 120,000; made by city, at owner's expense. Services, any kind; paid for by owner of property. Meters, 32,829; owned, controlled and repaired by consumer. Use of meters compulsory for all water for business consumption. City can compel use of meters for all but private services and any consumer may have one. Hydrants, 9,900. CONSUMPTION.—(Galls.) av., 189,000,000; max., 235,000,000; min., 170,000,000. PRESSURE.—Ordinary, 15 to 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $75,000,000. Expenses: Operating, $643,000; int., $1,800,000. Revenue, $3,973,052: Consumers, unmetered, $1,833,212; metered, $2,089,840. Balance goes to the payment of interest on city debt. MANAGEMENT.—Comr. of Pub. Wks., Gen. Chas. H. T. Collis; Engr. of Croton Aqueduct, G. W. Birdsall. SEWERS.—Has combined system of sewers. NOTE.—New Croton dam and Jerome Park reservoir are in charge of Aqueduct Commission; Chf. Engr., A. Fteley.

REFERENCES.—Engineering News: Mar. 5, '81; Croton water, Apr. 12, '84, Dec. 5, '85, Nov. 15, 22, 29, '90; Quaker Bridge dam, Feb. 20, 27, '86, Feb. 19, Dec. 24, '87, Feb. 4 and 11, Mar. 10, Nov. 3, '88, Oct. 11, Nov. 15, 22 and 29, '90; new aqueduct, July 11, '85, Oct. 20, '88, Nov. 22, '90, Apr. 9 and 23, '96; Reservoir "M" on Titicus River, Mar. 22, '90, with inset; Sodom dam, Dec. 1, '88, Oct. 25, '90; Croton dam, Dec. 22, '88, Nov. 15, '90, with inset, June 2, Aug. 4, '92, Aug. 15, Sept. 12, '95; history of water supply, July 19, Nov. 22 and 29, '90, May 12, '92, illus.; pollution of stream, Mar. 29, '94; Jerome Park Reservoir, July 18, Aug. 15 and 29, illus., Sept. 12, '95; supply for "Greater New York," Feb. 13, '96.

ANNEXED DISTRICTS.

In territory north of Harlem River and along and near Long Island Sound, annexed in '96, water was introduced in different municipalities before annexation by (1) New York & Westchester Water Co., (2) New York District Water Supply Co., and (3) Upper New York Water Co. Rept. Jan., '96, that (2) had sold out to (1). No information can be secured. Address Moses R. Crow, 27 William St., N. Y. City.

218, 219. **NIAGARA FALLS,** Niagara Co. (9,907.) Village of Suspension Bridge has been consolidated with Niagara Falls since '90.

CITY PLANT.

Built in '75 by former village of Suspension Bridge and still supplies that section of city. SUPPLY.—Niagara River, pumping direct. PUMPS.—Cap., 6,500,000 galls.; 1,500,000 and 5,000,000 Holly hor. water power. DISTRIBUTION.—Mains, 21 miles; cost extensions met by issue of bonds. Taps, 1,100; made by city for $1.50. Services, lead; paid for by consumer. Meters, 12; owned, controlled and repaired by city. Use of meters optional with city; compulsory for large consumers. Hydrants, 175. CONSUMPTION.—(Galls.) av., 3,500,000; min., 3,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $250,000. Debt, $207,000. Expenses, $18,000: Operating, $9,000; int., $9,000. Revenue (in '90): Consumers, $12,700; City, $2,800. MAN-

AGEMENT.—Prest., Arthur Schoelkopf, Mayor; Supt., H.A.Keller. Ch. Pump. Engr., Wm. Crosby. Rept. by Supt., June 25. PROJECTED IMPROVEMENTS.—Gravity filters. SEWERS.—Has sanitary and storm sewers. NOTE.—July, '96, Niagara Falls Water-Works Co. offered to sell its works to the city, to buy city works, either practically at cost of original construction, or to sell water for city plant.

NIAGARA FALLS WATER-WORKS CO.

Built in '77. Niagara Falls Power Co. owns majority of stock. New pumping station and filter plant added in '96; put in operation Apr. 1; Engr., W. A. Brackenridge; Contr., A. C. Douglass. FRANCHISE.—Rates are regulated by agreement with city and are the same as those of the municipal plant in the northern half of city. Co. is not exempt from local taxes. City to pay $2,410 per yr. for hydrants. SUPPLY.—Niagara River, filtered, then pumping direct, with stand-pipe to equalize pressure. PUMPS.—Cap., 6,000,000 galls.; Snow; 2—3,000,000 comp. dup. cond. Pittsburg lump and nut coal used; av. cost, $1.90 per short ton. FILTER.—Cap., 4,500,000 galls.; Jewell gravity. STAND-PIPE.—Cap., 753,000 galls.; 40 × 80 ft., steel on masonry foundation. FISCAL YEAR CLOSED Nov. 30, '96. DISTRIBUTION.—Mains, 15 miles; cost extensions met by loans and stock. Taps, 1,500; made by Co., free. Services, lead to curb stop; paid for by consumer. Meters, 22, are owned and repaired by Co.; yearly rental, 10% of cost. Co. can compel use of meters and any consumer may have one. Hydrants, 87. CONSUMPTION.—(Galls.) av., 2,617,270; max., 2,981,620; min., 2,185,640. PRESSURE.—Ordinary, 55 lbs.; fire, 120 lbs.—FINANCIAL.—Cost, about, $308,000. Cap. Stock: Authorized, $75,000; all paid-up; paid no div'd in '96. Pref'd, authorized, $75,000, all paid-up; no div'd guaranteed. Debt: Floating, $150,000, to be put in first mortgage 5% bonds. Expenses: Operating, $11,250; taxes, $1,967. Revenue, total, $2,124. MANAGEMENT.—Prest., Wm. B. Rankine, Mills Bldg., N. Y. city; Secy. and Treas., F. N. Wilcox; Supt., S. T. Murray; Ch. Pump. Engr., Edw. Brown. Rept. by Prest., Dec. 10. PROJECTED IMPROVEMENTS.—Change from steam to water engines, under 120 ft. head in wheel-pit of Niagara Falls Power Co. REFERENCES.—Eng. News, Nov. 5. '81; Jewell filters, May 28, '96.

220. **NORTHPORT,** Suffolk Co. (Est., 1,800.) Built in '93 by Northport Water-Works Co.; put in operation Jan. Engr. and Contr., Oscar Darling, Huntington. FRANCHISE.—Perpetual. SUPPLY.—Lake fed by springs, pumping direct and to reservoir. PUMPS.—Cap., 500,000 galls.; 2—250,000 Worthington; a comp. non-cond. and a simple high pressure. RESERVOIR.—Cap., 350,000 galls. DISTRIBUTION.—(In '93.) Mains, 4 miles. Taps, 200. Services, galv. i. Meters, 1. Hydrants, 20. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—(In '93.) Cost, $50,000. Cap. Stock, authorized, $50,000; all paid-up. Expenses: Operating, $1,000. Revenue, $3,100. Consumers, $2,500; City, fire protection, $600. MANAGEMENT.—Prest., Jno. W. Fowler; Secy. and Supt., Jno. W. Olmsted; Treas., H. S. Mott. Rept. by Secy., Oct., 23, '93.

221. **NORTH TARRYTOWN,** Westchester Co. (3,179.) Built in '88 by Pocantico Water-Works Co. Supplies Dobbs' Ferry and Hastings-upon-Hudson. FRANCHISE.—30 yrs. SUPPLY.—Pocantico River, pumping direct and from impounding to distributing reservoir. PUMPS.—Cap., 3,000,000 galls.; Deane, 2,000,000; Gordon & Maxwell, 1,000,000. RESERVOIRS.—Cap., 130,000,000 galls.; one 120,000,000; one 10,000,000. DISTRIBUTION.—Mains, 25 miles. Taps, 300. Services, rustless i. Meters, 0. Hydrants, 105. FINANCIAL.—Cap. Stock, authorized, $500,000; Bonded debt, $250,000. NOTE.—No report since '90-91 Manual.

222. **NORTH TONAWANDA,** Niagara Co. (4,796.) Bought by village Mar., '94, from Niagara River Water-Works Co. (press rept. states price paid was $275,000.) First supplied in '85 (or '87) by Tonawanda City Water-Works Co., which built pumping station on island and from it supplied both North Tonawanda and Tonawanda. In (or about) '92, Co. sold distribution system in Tonawanda to that village, which see. See Projected Improvements. SUPPLY.—Niagara River, pumping direct. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Holly-Gaskill hor. high duty. DISTRIBUTION.—Mains, 16½ miles. Taps, about 1,100. Services, lead. Hydrants, public, 230. CONSUMPTION.—(Galls.) av., 1,683,421 (in '95). PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 150 lbs. FINANCIAL.—Cost (purchase price), $275,000 (?). Bonded debt, $400,000: $275,000 at 4%, and $125,000 at 4½%; all 30-yr. (probably from '94 and '96, respectively.—Ed.). MANAGEMENT.—Comrs., E. C. McDonald, Frank Bott and others. Rept. by Supt., S. C. Woodruff, Feb. 5, '97. PROJECTED IMPROVEMENTS.—A 48-in. steel intake pipe, extending 1,200 ft. into Niagara River; 6,000,000-gall. pump; about 18 miles of pipe. Contrs. for all but pump, Michigan Pipe Co., Bay City, Mich.; about 12 miles of pipe already laid and balance of contract to be completed by Aug. 1, '97. Bids for pump were to be received Feb. 9, '97.

223. **NORTHVILLE,** Fulton Co. (792.) Built in '91 by village; put in operation Oct. 1. SUPPLY.—Fish Creek and springs, by gravity. RESERVOIRS.—Cap., 2,500,000 galls.; storage, located two miles from village. FISCAL YEAR CLOSED May 30. DISTRIBUTION.—Mains, 10 miles; cost extensions met by taxation. Taps, 160; made by village for $5 for ½-in. and $6 for ¾-in. service. Services, lead and iron; paid for by property owner. Meters, 0. Hydrants, 32. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $35,000 Bonded debt, $32,000, at 3½%; due, $2,000 in 1906, and $2,000

yearly thereafter. Expenses, $1,620: Operating, $250; int., $1,120; taxes, $250. Revenue, $1,706: Consumers, unmetered, $1,485; street sprinkling, $100; other purposes, $121. MANAGEMENT.—Prest., Geo. E. Van Arnam; Secy., Lee S. Anibal; Treas., Wm. Harris. Rept. by Supt. E. G. Palmer, Oct. 14. SEWERS.—None.

224. **NORWICH,** Chenango Co. (5,212.) Built in '81 by Norwich Water-Works, a private corporation. SUPPLY.—Hopkins' brook, by gravity from impounding reservoirs. RESERVOIRS.—Cap., 90,000,000 galls.; impounding. DISTRIBUTION.—Mains, 15 miles. Taps, 1,025. Meters, 0. Hydrants, public, 42. FINANCIAL.—Cap. Stock: Common, authorized, $50,000; all paid-up. Debt, $75,000. MANAGEMENT.—Prest., Howard D. Newton; Secy., T. Dewitt Miller; Treas., Cyrus B. Martin; Supt., John G. Seward. Rept. by Treas., Nov. 23. REFERENCE.—Eng. News, June 3, '82.

225. **NUNDA,** Livingston Co. (1,010.) Built in '86-7 by Nunda Water Co. SUPPLY.—Springs, by gravity, with pumping to reservoir for reserve. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7 miles. Taps, 35. Hydrants, 25. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $25,000. No debt. Expenses, $400: Operating, $300; taxes, $100. Revenue, $1,300: Consumers, $300. City, fire protection, $1,000. MANAGEMENT.—Prest., Miles Ayrault; Secy. and Supt., H. Willard. NOTE.—Request for information returned marked "no change in our works." Above information is that given in the '90-'91 Manual.

226, P 9. **NYACK,** Rockland Co. (4.111.)

NYACK WATER-WORKS CO.

Built in '73. Village proposes to buy works and commission has been appointed for that purpose. SUPPLY.—Springs and Hackensack River by gravity and pumping to reservoir. PUMPS.—Cap., 1,350,000 galls.; 600,000 Blake; 750,000 Worthington comp. non-cond. RESERVOIRS.—(In '89.) Cap., 2,000,000 galls. Largest reservoir has cap. 1,000,000; receives water pumped from river; two miles from and 275 ft. above river and 300 ft. above village. Five small reservoirs, in addition. DISTRIBUTION.—Mains (in '88), 13 miles. Taps, 550. Meters, 0. Hydrants, 30. PRESSURE.—Ordinary, (in '89) 55 lbs. FINANCIAL.—Cap. Stock: Common, authorized, $100,000; all paid-up. Total debt, $62,000: Floating, $12,000, at 6%; Bonded, $50,000, at 6%; due in 1901. Expenses, $10,292: Operating, $5,600; int., $3,720; taxes, $972. Revenue, $12,275: Consumers, $10,500: City, fire protection, $1,775. MANAGEMENT.—Prest., A. M. Voorhis. SEWERS.—Has sanitary sewers. No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 24, '86.

MUNICIPAL WORKS.

In '96 village laid 10.28 miles 12 to 14-in. mains, on which 80 hydrants will be set. Plans are being prepared for gravity supply from 150,000,000-gall. storage reservoir, 456 ft. above village; supply main, 8 miles, 14-in. pipe. Rept. by Engr., Jas. S. Haring, Nyack.

227. **OGDENSBURGH,** Saint Lawrence Co. (11,662.) Built in '68 by city. SUPPLY.—Oswegatchie River, pumping direct. PUMPS.—Cap., 5,000,000 galls.; Lang double-acting water power, 2,000,000 and 3,000,000. Reynoldsville coal used; av. cost, $3.25 per short ton. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 22 miles; cost extensions met by rentals. Taps, 2,200; made by city, actual cost paid by consumer. Services, galv. i.; consumer pays cost and receives rebate of 40 cts. per ft. Meters, 0; under discussion. Hydrants, 130. CONSUMPTION.—(Galls.) av., 2,200,000; max., 3,000,000; min., 2,000,000. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $220,000. Bonded debt, $109,000, at 3½%; due, $4,000 per yr. Expenses: Operating, $5,000; int., $3,815. Revenue: City, none. Works are self-sustaining. MANAGEMENT.—Prest., W. M. Baird; Clk., H. L. Jones; Rept. by Supt., H. A. Lord, June 9. PROJECTED IMPROVEMENTS.—Increased pump capacity. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 1, '81.

228. **OLEAN,** Cattaraugus Co. (7,358.) Built in '78 by village; rebuilt and extended in '83. SUPPLY.—Driven and dug wells and Alleghany River, pumping to reservoir. In '89 there was a 25 × 16 ft. well, with 20 3-in. driven wells in bottom and 12-in. pipe, leading to river for emergency use. PUMPS.—Cap., 3,000,000 galls.; 2,000,000 Holly-Gaskill hor. high duty; 1,000,000 Worthington. Gas used. RESERVOIRS.—Cap., 2,500,000 galls.; 230 to 250 ft. above village. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 15 miles; cost extensions met by revenue. Taps, 1,200; made by consumer. Services, galv. i. and lead; paid for by property owner. Meters, 18; owned and repaired by consumer; controlled by city. Use of meters optional with consumer, except compulsory for manufacturers. Hydrants, public, 111; private, 8. CONSUMPTION.—(Galls.) av., 1,250,000; max., 1,000,000. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $122,460. Bonded debt, $60,000, at 4½%; $12,500, at 4%. Expenses, $10,683: Operating, $7,483; int., $3,200. Revenue, $16,390. MANAGEMENT.—Prest., D. E. Barrows; Secy. and Supt., John Z. Le Fevre; Treas., W. F. Burlingham. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News., Apr. 26, '84.

229. **ONEIDA,** Madison Co. (6,083.) Bought by village Sept. 6, '95, for (press rept.) $148,000. Built in '83 by Warner Water-Works Co., under 50 yrs. franchise. SUPPLY.—

Springs, by gravity from impounding reservoir. RESERVOIRS.—Cap., 25,000,000 galls.; area, 6½ acres; depth at dam, 28 ft.; 190 ft. above and 2¾ miles from village. DISTRIBUTION.—Mains, 13 miles. Services, lead. Meters, 5; owned and controlled by consumer. Use of meters optional with consumer. Hydrants, public, 83; private, 2. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $150,000. Bonded debt, $150,000, at 3½%. MANAGEMENT.—Comrs. Rept. by A. E. Loomis, June 6. SEWERS.—Under construction. REFERENCE.—Eng. News, June 13, '85.

230. **ONEONTA,** Otsego Co. (6,272.) Built in '82 by Oneonta Water-Works Co. FRANCHISE.—City to pay $30 per hydrant per annum. SUPPLY.—Oneonta Creek, by gravity. RESERVOIRS.—Cap., 522,000,000 galls.; storage, 500,000,000; distributing, 22,000,000. DISTRIBUTION.—Mains, 25 miles; cost extensions met by loans and receipts. Services, lead and iron; paid for by property owner. Hydrants, public, 87; private, 3. PRESSURE.—Ordinary, 65 lb. FINANCIAL.—Cost, $234,424. Cap. Stock, authorized, $200,000. MANAGEMENT.—Prest., Geo. I. Wilber; V. Prest. and Secy., T. A. Norton; Treas., E. A. Scramling; Supt., J. G. Hoyt. Rept. by Secy., June 12. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 20, '83.

D 20. **ORWELL,** Oswego Co. (1,370, town.) A. E. Olmstead owns a 4-in. c. i. conduit, 3,000 ft. long, supplying about 20 houses from a spring with 50-ft. head. Rept. by owner, Aug. 12.

231. **OSWEGO,** Oswego Co. (21,842) Built in '67 by Oswego Water-Works Co. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $15,000 per yr. for fire hydrants, fountains and public buildings. Contract for 15 yrs., from '88, independent of franchise. Council may order main extensions, but must pay $50 per yr. for one hydrant for each 500 ft., or any part of same over 100 ft., and also first cost of hydrant and connection. SUPPLY.—Oswego River, pumping to two settling and filtering reservoirs. Drainage area, 3,000 sq. miles, including 7 large lakes. PUMPS.—Cap., 5,000,000 galls.; 2—2,500,000 Storer dup., driven by McCormick turbines. FILTERS.—Cap., not given; sand and gravel. 5,000,000 each. RESERVOIRS.—Cap., 15,000,000 galls. Two distributing reservoirs, one on either side of river, with partition walls and filters in each, with aerating stand-pipe on each pumping main. East reservoir, 187 ft., west, 153 ft. above city. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 46 miles. Taps, 1,600; made by Co. free. Services, iron; paid for by consumer. Meters, 200; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for all except houses, stores, blocks and offices. Hydrants, public, 278; private, 16. CONSUMPTION.—(Galls.) av., 2,330,500. PRESSURE.—Ordinary, 60 to 65 lbs.; fire, 100 to 125 lbs. Steam fire engines are used at large fires. FINANCIAL.—Cost (in '90), $585,091. MANAGEMENT.—Prest., John T. Mott.; Secy., Henry H. Lyman; Treas., Elliott B. Mott; Supt., Thos. H. Bennett. Rept. by Supt. June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 26, '81.

119. **OSWEGO FALLS,** Oswego Co. (1,821.) Supply from Fulton.

232. **OTEGO,** Otsego Co. (1,840, town.) Built in '89 by Otego Water Co. SUPPLY.—Otsdawa Creek and springs, by gravity. RESERVOIR.—Cap., 80,000 galls. DISTRIBUTION.—Mains, 4½ miles. Taps, 115. Services, galv. i. Hydrants, 16. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—(In '90) Cost, $17,000. MANAGEMENT.—Prest., W. H. Parker; Secy. and Treas., Lottie A. Field, Cooperstown. Rept. by Prest., July 13.

233. **OWEGO,** Tioga Co. (9,008, town.) Built in '79 by Owego Water Co. FRANCHISE.—Provides for purchase of works by city. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. SUPPLY.—Barnes Creek and wells, pumping from impounding to distributing reservoirs. PUMP.—Cap., 1,000,000 galls.; Worthington simple high pressure. Anthracite pea coal used; av. cost, $2.75 per short ton. FILTERS.—Cap., 750,000 galls.; New York. RESERVOIRS.—Cap., 46,000,000 galls.; impounding, 45,000,000; distributing, 1,000,000. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 401; made by Co. at cost. Services, iron; paid for by consumer. Meters, 15; owned, controlled and repaired by Co.; yearly rental, $3. Co. can compel use of meters and any consumer may have one. Hydrants, 65. CONSUMPTION.—(Galls.) av., 750,000; max., 800,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $195,000. Cap. Stock: Authorized, $100,000. Bonded debt, $80,000, at 6%. Expenses, $10,600: Operating, $5,000; int., $4,800; taxes, $800. MANAGEMENT.—Prest. and Treas., Walter Wood; Secy., A. W. MacCullum, both of 400 Chestnut St., Philadelphia; Supt., Geo. Y. Robertson. SEWERS.—Partial sanitary system. REFERENCE.—Eng. News, Nov. 11, '82.

D 21, F 1. **OXFORD,** Chenango Co. (1,477.)

DOMESTIC SUPPLY.

At least 20 different individuals or associations furnish water. Supply, springs, by gravity. Rept. by C. M. Dodge, Village Prest.

FIRE PROTECTION.

Works owned by village. Supply, Chenango River, pumping by water power.

234. **PALMYRA,** Wayne Co. (2,131.) Built in '89-90 by Palmyra Water-Works Co.; tested Feb. 7, '91. (See note under Brockport.) FRANCHISE.—Provides for purchase of works by city after 5 yrs. SUPPLY.—Surface well, pumping to stand-pipe. Well is about 20 × 20 ft. PUMPS.—Cap., 1,200,000 galls. STAND-PIPE.—Cap., 200,000 galls.; steel. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5 miles. Taps, 60. Services, galv. i. Meters, 29. Hydrants, 40. PRESSURE.—(In '89.) Ordinary, 75 lbs.; fire, 125 lbs. FINANCIAL.—Cap. Stock, authorized, $50,000; all paid-up; Bonded debt, $50,000, at 6%; due 1909. NOTE.—No report since '90-1 Manual.

D 21½. **PARISHVILLE,** Saint Lawrence Co. (578.) Built in '87 by A. N. Clark, Engr., D. B. Bailey. Supply, spring, by gravity. Mains, 1½ miles. Taps, 40; made by owner of works. Services, iron; paid for by consumer. Pressure, ordinary, 15 lbs. Cost, $2,500. Debt, $600. Rept. by owner, July 8. No sewers.

236. **PATCHOGUE,** Suffolk Co. See Bay Shore.

237. **PAWLING,** Dutchess Co. (630.) Built in '95 by village; put in operation in Nov. Engrs., Stanwix Eng. Co., Rome. Contr., Donato Cuozzo, N. Y. City. Contract was originally awarded to the Wild Eng. Co., Valatie, N. Y., who gave up the work when it was partly completed. SUPPLY.—Brook, by gravity, diverted to storage reservoir, 1 mile from source, through tile line. RESERVOIRS.—Cap., 25,000,000 galls.; 2 miles from center of distribution. DISTRIBUTION.—Mains, 6 miles. Taps, 60, made by village, free. Services, galv. i. Meters: 30; owned, controlled and repaired by village; yearly rental, $2. Use of meters compulsory for all consumers. Hydrants, 32. PRESSURE.—Ordinary and fire, 104 lbs. FINANCIAL.—Cost, $43,000. Bonded debt, $45,000, at 4%; due in 5 to 30 yrs. MANAGEMENT.—Prest., John B. Dutcher; Secy., F. Olmstead; Treas., Elmore Ferris. Rept. by Secy., June 18. SEWERS.—None.

238. **PEEKSKILL,** Westchester Co. (9,676.) Built in '75 by city. SUPPLY.—Van Cortland Creek, pumping to reservoir. Drainage area, about 5 sq. miles. PUMPS.—Cap., 4,000,000 galls.; 3,000,000 Holly-Gaskill hor. high duty; two Vergennes, combined cap., 1,000,000. Pittston anthracite pea coal used; av. cost, $3.38 per short ton. RESERVOIR.—Cap., 36,000,000 galls.; 354 ft. above city. FISCAL YEAR CLOSED Feb. 20, '96. DISTRIBUTION.—Mains, 14.65 miles; cost extensions met by bonds. Taps, 1,092; made by village for $4.50; when curb box and cock is furnished, $7. Services, galv. i.; paid for by consumer. Meters: 150: owned by consumers and village; yearly rental, $1.60 for ½-in. Use of meters optional with village; compulsory for liveries, saloons, drug stores and manufacturers. Hydrants, 133. CONSUMPTION.—(Galls.) av., 1,080,000. PRESSURE.—Ordinary, 80-160 lbs. FINANCIAL.—Cost, $208,167. Bonded debt, at 3.7, 4, 5, and 7%. Sinking Fund: $23,068; deposited in savings bank. Expenses: Operating, $10,080; int., $12,779. Revenue, $24,221: Consumers, unmetered, $12,282; metered, $4,130; City, fire protection, $7,093; other purposes, $656. MANAGEMENT.—Prest., Dr. P. H. Mason; Secy., Oscar V. Barger; Treas., Edward F. Hill; Supt., Orrin J. Loder; Ch. Pump. Engr., O. W. Meeks. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 27, '81.

239. **PELHAM,** Westchester Co. (3,941, town.) Supplied partly by New Rochelle Water Co. and partly by New York & Westchester Water Co. Mar., '96, latter Co. is said to have made a five-year contract with the town.

240. **PELHAM MANOR,** Westchester Co. (In '80, 2,540.) Built in '91 by Pelham Heights Co. SUPPLY.—New Rochelle Water Co.'s Works. DISTRIBUTION.—Mains, 6 miles. Hydrants, 35. FINANCIAL.—Cap. Stock: Authorized, $350,000. NOTE.—No report since '90-1 Manual.

206. **PELHAMVILLE,** Westchester Co. (Est., 223.) Supply from Mt. Vernon.

241. **PENN YAN,** Yates Co. (4,254.) Built in '94-5 by village. Engr., Walter F. Randall, Syracuse. Fire protection works built in '94. SUPPLY.—Keuka Lake, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 comp. non-cond. RESERVOIRS.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 10 miles. Taps (Aug., '95), 423. NOTE.—Above from press repts. REFERENCE.—Eng. News, June 27, '85.

242. **PERRY,** Wyoming Co. (1,528.) Built by village; put in operation Feb. 15, '96. Engrs., Voorhees & Witmer, Buffalo. Contr., W. B. Wilson, Buffalo. SUPPLY.—Silver Lake, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. Bituminous run of mine coal used; av. cost, $2 per short ton. FILTER.—Cap., 250,000 galls.; Loomis-Manning. STAND-PIPE.—Cap., 1,000,000 galls.; 15 × 75 ft., iron, on high elevation. FISCAL YEAR BEGAN Jan. 15. DISTRIBUTION.—Mains, 9 miles. Taps, 118; made by village to curb. Services, galv. i.; paid for by property owner. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 80,000; max., 100,000; min., 50,000. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $43,000. Bonded debt, $43,000, at 4%; due in 1915. Expenses, $2,570: Operating, $850; int., $1,720. Revenue: Consumers, $1,200 to Aug. 14; City, none. Deficits will be paid from general fund. MANAGEMENT.—Prest., Chas. H. Toan; Secy., Geo. B. Tallman; Treas., Wm. D. Page; Supt., P. A. McArthur; Ch. Pump. Engr., J. H. Van Houten. Rept. by Treas., Aug. 14. SEWERS.—Partial system of sanitary sewers and a system for storm water.

243. **PHELPS,** Ontario Co. (1,336.) Purchased by village in '96 for $40,000, and improved since; built in '89 by Phelps Water-Works Co. Engr. of new supply, E. D. Smalley, Syracuse. SUPPLY.—Springs, by gravity. DISTRIBUTION.—(In '90). Mains, 4 miles. Taps, 50. Meters, 14. MANAGEMENT.—Water Comrs. NOTE.—Press rept., July 25, '96, stated spring was to be added to supply, reservoir built and three miles mains laid. Jan. 1, '97, Jno. T. Watkins, Vil. Clk., rept. that contracts (not stating for what) had been let some months ago and that water-works had been completed.

244. **PHILADELPHIA,** Jefferson Co. (783.) Built in '96 by village; put in operation June 1. Engrs., Bond & Hinds, Watertown. Contr., A. F. Nims. SUPPLY.—Springs, by gravity. FILTERS.—Cap., 400,000 galls. RESERVOIR.—Cap., 525,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 100. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 35; private, 1. FINANCIAL.—Cost, $30,500. Bonded debt, $29,500 at 4%. Expenses: Int., $1,200. MANAGEMENT.—Prest., Wm. Roberts; Secy., I. C. Mosher; Treas., A. C. Comstock. Rept. by Treas., Nov. 13.

245. **PHILMONT,** Columbia Co. (1,818.) Built in '96 by village. Engrs., Stanwix Engineering Co., Rome. Contr., Jno. Marsden, Utica. SUPPLY.—Forest Lake, by gravity; fall 300 ft. DISTRIBUTION.—Mains, 8 miles were proposed when bids were invited. FINANCIAL.—Cost, about $40,000. MANAGEMENT.—Prest., C. N. Harder. Secy., F. B. Harder. Rept. by Wm. H. Stickles.

246. **PHOENICIA,** Ulster Co. (Est., 354.) Put in operation Jan. 1, '93, by Phoenicia Water-Works Co. Engr. and Contr., John A. Longyear, Kingston. FRANCHISE.—Co. is not exempt from local taxes and there is no compensation for public service. SUPPLY.—Springs on mountain side, by gravity. RESERVOIRS.—Cap., 200,000 galls.; distributing; 184 ft. above and about ¾ mile from village; masonry; covered. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1 mile; cost extensions met by income. Taps, 28; made by Co. Services, galv. i.; paid for by property owner. Meters, 0. Any consumer may have a meter. Hydrants, private, 5. CONSUMPTION.—(Galls.), av., 25,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock: Authorized, $12,000; all paid-up; paid no div'd last yr. Bonded debt, $10,000, at 6%; due in 1913. Expenses, $710: Operating, $75; int., $600; taxes, $35. Revenue: Consumers, about $725. MANAGEMENT.—Prest., John L. McGrath; Secy. and Supt., A. J. Simpson; Treas., Robert Jamieson. Rept. by Secy., June 10. SEWERS.—None.

247. **PHOENIX,** Oswego Co. (1,466.) First supplied in '79. In '88 Phoenix Water Co. built works; on July 1, '95, Co. reorganized as Phoenix Water Supply Co. Press rept. states works were sold at auction in June, '94. FRANCHISE.—30 yrs. from '87. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. SUPPLY.—Oswego River, wells and springs, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls; 2—1,250,000 Volker & Felthousen water power. STAND-PIPE.—Cap., 188,000 galls.; 20 × 80 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 6 miles. Taps, 150; made by Co., free. Services, galv. i.; paid for by consumer. Hydrants, 30. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $65,000. Bonded, $35,500, at 3%. No sinking fund. Expenses, $3,769: Operating, $2,400; int., $1,065; taxes, $304. Revenue: City, fire protection, $1,500. MANAGEMENT.—Prest., Niel Gray, Oswego; Secy. and Treas., O. F. Gaylord, Oswego; Supt., and Ch. Pump. Engr., J. I. Van Doren. Rept. by Supt., July 6. SEWERS.—None.

248. **PINE HILL,** Ulster Co. (Est., 402.) Built in '95 by Pine Hill Water Co.; put in operation in July. Engr., John A. Longyear. Contr., R. W. Hill. FRANCHISE.—Does not provide for purchase of works by city. Co. not exempt from local taxes. No legal difficulties. SUPPLY.—Springs (by gravity ?). RESERVOIR.—Cap., 150,000 galls. FISCAL YEAR CLOSED July 18. DISTRIBUTION.—Mains, 2 miles; cost extensions met by Co. Taps, 60; made by consumer for $2. Services, iron; paid for by consumer. Meters, 0. Hydrants, 20. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $12,000. Cap. Stock, $15,000: Common, authorized, $15,000; all paid-up; paid 4½% div'd last year. No debt. Expenses: Operating, $10; taxes, $23. MANAGEMENT.—Prest., Jas. C. Cornish; Secy., Jas. A. Betts, Kingston, N. Y.; Treas., Andrew D. Hill. Rept. by Supt., R. W. Hill, Sept. 15. SEWERS.—None.

249. **PINE PLAINS,** Dutchess Co. (Est., 636.) Built in '96 by Pine Plains Water Co.; put in operation May 1. Engr. and Contr., Jno. R. Thompson, Amenia. SUPPLY.—Well, pumping to reservoir (?). PUMPS.—Blake. Cumberland coal used. RESERVOIRS.—Cap., 201,000 galls.; in solid rock, 56 × 24 × 20 ft. DISTRIBUTION.—Mains, 3 miles. Taps, 60; made by Supt.; free of charge. Services, galv. i.; paid for by consumer. Meters, 1; owned by consumer; controlled by Co.; repairs paid by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 24. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cap. Stock: Authorized, $12,000; all paid-up. No debt. Revenue: City, fire protection, $400. MANAGEMENT.—Prest., F. Bostwick; Secy. and Treas., W. Bostwick. Rept. by Supt., J. R. Thompson, Amenia, June 11. SEWERS.—None.

250. **PLATTSBURGH,** Clinton Co. (7,010.) Built in '70 by village. SUPPLY.—Surface water, by gravity. RESERVOIRS.—Impounding: Cap., 3,450,000; area, 3 acres; av. depth, 6 ft.; about 6 miles from village. DISTRIBUTION.—Mains, 15 miles. Meters,

0. Hydrants, 68. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 86 lbs. FINANCIAL.—Cost (in '81), $180,000. Expenses: Operating, $3,072. Revenue: Consumers, $17,565. NOTE.—No official report since '90-1 Manual. June 1, '95, Ned Baker and C. E. M. Edwards were Comrs.

251. **PORT BYRON,** Cayuga Co. (1,105.) Built in '72 by village. SUPPLY.—Well, pumping to reservoir. PUMPS.—Cap., 100,000 galls.; Ramsey water power. RESERVOIR.—Cap., 800,000 galls.; 160 ft. above business, 30 to 40 ft. above highest resident part of village. DISTRIBUTION.—Mains, 3¼ miles. Taps, 65. Meters, 0. Hydrants, 30. CONSUMPTION.—(Galls.) av., 80,000 est. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $15,500. No debt. Expenses, $300. Revenue, $350. Rept. by J. W. Barrus, Trustee, Sept. 29, '96. REFERENCE.—Eng. News, Mar. 25, '82.

252. **PORT CHESTER,** Westchester Co. (5,274.) Built in '84 by Port Chester Water-Works Co.; supplies East Portchester, Conn., and Rye and Harrison, N. Y. In connection with Greenwich (Conn.) Water-works which see. FRANCHISE.—Village to pay $1,500 per yr. for 64 hydrants; additional, $25 each. Water for municipal building, fire house, watering trough and 3,500,000 galls. annually for flushing sewers, free; water for sewer flushing in excess of this amount at 15 cts. per 1,000 galls. SUPPLY.—Greenwich, Conn., Water Co.'s Works; filtered. DISTRIBUTION.—Mains, 25 miles. Taps, 1,300. Meters, 500. Hydrants, public, 64; private, 10. CONSUMPTION.—(Galls.) ave., 600,000. PRESSURE.—Ordinary, 80 lbs; high service, 105 lbs. Steam fire engines are used. FINANCIAL.—Revenue: City, fire protection, $1,500. MANAGEMENT.—Prest., John W. Lounsberry; Secy., John W. Diehl; V. Prest. and Treas., Wm. G. Abendroth; Supt., John Dayton; Inspector, R. C. Bacot, Jr. Rept. by W. S. Bacot, Engr., Oct. 27. SEWERS.—Has sanitary sewers.

253. **PORT HENRY,** Essex Co. (2,436.) Built in '92 by village. Engr., E. D. Smalley, Syracuse. Contrs., Jas. H. Harlow & Co., Pittsburg. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 600,000 galls. Collecting: 100,000; about 2½ miles from village; circular, 75 x 6 ft. Distributing: 500,000; about ¾ mile from village; 100 ft. sq., 11 ft. deep. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 9 miles. Taps, 245; made by consumer, no fee to village. Services, galv. i.; paid for by consumer. Meters, 1; owned and controlled by village; repairs paid by consumer. Use of meters compulsory for printing office. Village can compel use of meters and any consumer may have one. Hydrants, 50. PRESSURE.—Ordinary, 100 to 155 lbs. Steam fire engines are occasionally used. FINANCIAL.—Cost, $50,000. No sinking fund. Revenue: Consumers, unmetered, $3,600; metered, $50. MANAGEMENT.—Prest., Wm. H. Carr; Secy., Seward A. Foote; Treas., John Agnew; Supt., Geo. C. Wheelock. Rept. by Supt., Dec. 3. SEWERS.—Has sanitary and storm sewers.

254. **PORT JERVIS,** Orange Co. (9,827.) Built in '70 by Port Jervis Water-Works Co. FRANCHISE.—Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Press rept., Dec. 2, '96, states N. Y. Court of Appeals had just decided that city must pay for water furnished by Co., for 3 yrs. ending May, '89, to public fountain, watering troughs, sprinkling wagons, jail and hose houses. City claimed that contract compelled it to pay for fire protection, only. SUPPLY.—Brooks and springs, by gravity from storage reservoir. RESERVOIRS.—Jansen's Lake; storage cap., 175,000,000 galls.; area, 25 acres; max. depth, 24 ft.; about 300 ft. above village, 145 ft. above and 3 miles from lower reservoir. Reservoir Lake; cap. not given; area, 17 acres. FISCAL YEAR CLOSED Mar. 31, '96. DISTRIBUTION.—Mains, 17½ miles; cost extensions met by income. Taps, 1,250; made by Co. Services, lead and iron; paid for by consumer. Meters: 60; owned, controlled and repaired by Co.; no rental charged. Use of meters optional with Co.; compulsory for large consumers. Hydrants, 131. CONSUMPTION.—(Galls.) av., 1,250,000. PRESSURE.—Ordinary and fire, 60 lbs. One steam fire engine is used. FINANCIAL.—Cost (in '90), $120,000. Cap. Stock: Common, paid-up, $100,000; paid 10% div'd last yr. No preferred stock. Debt, $63,650: Floating, $11,650, at 5%; Bonded, $52,000, at 5%; due $3,000 in 1901, $49,000 in 1913. Expenses, $13,037: Operating, $8,218; int., $2,786; taxes, $2,033. MANAGEMENT.—Prest., Peter E. Farnum; Secy., Christoph Graebner; Treas., Chas. F. Van Inwegen. Rept. by Prest., Aug. 12. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 14, '83.

D 22. **PORT LEYDEN,** Lewis Co. (462.) Press rept. says that works for domestic supply were built in '95 by Jno. McHale. Mains, about 1¼ miles.

210. **PORT RICHMOND,** Richmond Co. See New Brighton.

255. **PORTVILLE,** Cattaraugus Co. (2,339.) Built in '96 by village; put in operation Oct. 1. Engr., D. W. Clark, Tionesta, Pa. SUPPLY.—Springs, by gravity; 2½ miles vitrified pipe lead from springs to reservoir. RESERVOIR.—Cap., 180,000 galls.; 200 ft. above village. DISTRIBUTION.—Mains, 2¾ miles. Taps, made for $6. Services, galv. i.; paid for by owner of property. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 28. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $12,600. Bonded debt, $12,000, at 4%; payable $1,000 annually after June 1, 1901. MANAGEMENT.—Prest., J. E. Dusenbury; Secy., H. J. Crandall; Treas., C .K. Wright. Rept. by William Holden, Nov. 17. SEWERS.—None.

256. **POTSDAM,** Saint Lawrence Co. (3,961.) Built in '71 by village. SUPPLY.—Racket River, pumping direct. Drainage area, 30 sq. miles. PUMPS.—Cap., 2,370,000 galls.; 1,500,000 Lang water power, 870,000 Snow steam. Bituminous coal used; av.

cost, $3.35 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8¾ miles; cost extensions met by rentals. Taps, 750; made by consumer. Services, galv. i.; paid for by consumer. Meters, 5; owned, controlled and repaired by village. Use of meters optional with consumer. General use of meters under consideration. Hydrants, 75. CONSUMPTION.—(Galls.) av., 856,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost $75,000. Bonded debt, $31,000, at 4%. Expenses, $3,200: Operating, $2,000; int., $1,200. Revenue: Consumers, $6,000; City, none. MANAGEMENT.—Prest., W. H. Walling; Secy., S. C. Crane; Treas., Jas. P. Bonney; Supt., W. F. P. Sealy. Rept. by Supt. Oct. 1. PROJECTED IMPROVEMENTS.—Either new pumping plant or a gravity system, with filtration. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 1, '81.

257. **POUGHKEEPSIE,** Dutchess Co. (22,206.) Built in '70 by city. SUPPLY.—Hudson River, pumping to reservoir. PUMPS.—Cap., 8,000,000 galls.; 3,000,000 Worthington comp. cond. low duty; 5,000,000 Holly-Gaskill hor. crank and fly wheel high duty. Pittston pea anthracite coal used; av. cost, $2.50 per short ton, in shed. FILTER BEDS.—(Including addition in '96.) Cap., 6,000,000 galls.; area, 58,040 ft.; filtering material, sand, gravel and stone, 54 ins. Force main, 18-in. c. i., 7,700 ft. long. RESERVOIR.—Cap., 12,000,000 galls.; on College Hill, 280 ft. above mean water level of pump well. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 22.7 miles; cost extensions met by revenue. Taps, 2,745; made by dept. for $3.50. Services, lead; paid for by consumer. Meters, 1,916; owned, controlled and repaired by city; yearly rental, 10% of cost. Use of meters compulsory for all services added since '86. City can compel use of meters and any consumer may have one. Hydrants, 396. CONSUMPTION.—(Galls.) av., 1,881,576; max., 2,154,899; min., 1,717,243. PRESSURE.—Ordinary (in '89), 40 to 120 lbs. FINANCIAL.—Cost (in '90), $588,846. Bonded debt, $550,000, at 7%. Expenses: Operating $24,060. Revenue, $34,193: Consumers unmetered $7,431; metered, $25,679; street sprinkling, $1,083. Interest on bonds paid by general tax. Operating expenses and extensions of mains paid by revenue; excess of revenue goes into sinking fund. MANAGEMENT.—Bd. of Pub. Wks. Prest., Jas. E. Dutcher; Secy. and Supt., Chas. E. Fowler; Ch. Pump. Engr., Westervelt Ackerman. Rept. by Supt., July 18. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 6, '81; filter beds, Apr. 28, '92, May 18, '93, June 27, '95.

258. **PRATTSVILLE,** Greene Co. (384.) Built in '85 by Prattsville Water Co. FRANCHISE.—10 yrs. from '85. SUPPLY.—Stream, by gravity. DISTRIBUTION.—Mains, 2 miles. Taps, 18. Hydrants, 10. FINANCIAL.—Cost, $7,000. Expenses, $50. Revenue, $400. NOTE.—No rept. since '90-1 Manual.

259. **PULASKI,** Oswego Co. (1,517.) Built in '87 by village. SUPPLY.—Spring brook, pumping from impounding reservoir. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup. water power; Leffel water wheel under 28 ft. head. RESERVOIR.—Area, 5 to 6 acres. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 6 miles; cost extensions met by taxes. Taps, 285; made by consumer for $5. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 40. CONSUMPTION.—(Galls.) av., 70,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $32,000. Bonded debt, $25,000, at 4%; due July 1, 1906. Expenses, $1,288: Operating, 288; int., $1,000. Revenue, $1,803: Consumers, $1,720; City, fire protection, $83. MANAGEMENT.—Prest., Chas Tollner; Secy., Lorenzo Ling; Treas., C. D. Burch; Ch. Pump. Engr., E. D. Fitch. Rept. by Secy., June 5. SEWERS.—None.

260. **RANDOLPH,** Cattaraugus Co. (1,201.) Built in '85 by village. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 1,700,000 galls.; two impounding, 700,000 and 1,000,000 resp. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by surplus earnings. Taps, 200; made by consumer. Services, iron; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 20. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $24,000. Bonded debt, $22,000, at 4%. No Sinking fund. Expenses, $1,540: Operating, $25; int., $840; taxes, $675. Revenue: City, none. MANAGEMENT.—Prest., John E. Leach; Secy. and Treas., Wm. L. Rathbone. Rept. by Secy., July 13. SEWERS.—None. REFERENCE.—Eng. News, June 7, '84.

P 10. **RAVENA,** Albany Co. (Not given.) Works projected by Co. Proposed supply, Lawson's Lake, by gravity to distributing reservoir. Est. cost, $75,000. Engr., Jno. A. Longyear, Kingston. Rept. by C. L. Dieton, July 8, '96. Feb. 15, '97, Town Clk., J. M. Russell, rept. that Town Board hope to grant franchise by Mar. 1, '97.

261. **RED HOOK,** Dutchess Co. (935.) Built in '96 by village; put in operation July 1. Engrs., E. D. Smalley, G. G. Hartes, Herkimer, and Chas. E. Gregory. SUPPLY.—Well, 18-ft. diam., pumping to reservoir. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure. Anthracite pea coal used; av. cost, $3.50 per short ton. RESERVOIRS.—Cap., 400,000 galls.; on hill 2½ miles from center of village. DISTRIBUTION.—Taps made for $7. Services, galv. i.; paid for by consumer. Hydrants, public, 44. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $28,000. Bonded debt, $30,000, at 4%; due in 20 yrs. MANAGEMENT.—Prest., D. W. Wilbur; Secy., H. L. Cookingham; Treas., H. Ellsworth. Rept. by Prest., June 10. SEWERS.—None.

262. **RENSSELAERVILLE,** Albany Co. (2,112, town.) Built in '96 by C. E. & F. M. Andrus; put in operation in Aug. SUPPLY.—Brook, by gravity. DISTRIBUTION.—

Mains, 1. Taps, 20. Hydrants, 10. FINANCIAL.—Cap. Stock: Authorized, $10,000. MANAGEMENT.—Prest., C. L. Andrus; Secy., F. M. Andrus; Treas., R. B. Robinson. Rept. by Secy. SEWERS.—None.

263. **RICHFIELD SPRINGS,** Otsego Co. (1,623.) Built in '79 by village. SUPPLY.—Springs and pumping from Allen's Lake to reservoir. PUMPS.—Cap., 1,000,000 galls.; Worthington simple high pressure. FILTERS.—Cap., 350,000 galls.; Hyatt (or New York). RESERVOIRS.—Cap., 9,000,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5 miles. Taps, 300. Meters: 46. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 3,000,000. FINANCIAL.—Cost, $49,500. Bonded debt, $48,000: $21,000, at 4%; $27,000, at 5%. Expenses, operating, $1,500. Revenue: Consumers, $5,000. Rates have been raised this year and better revenue is expected. MANAGEMENT.—Prest., Allen Bloomfield; Secy., James McKee; Treas., D. A. Bierman; Supt., Geo. Monohan, Jr. Rept. by Secy., Sept. 29. REFERENCE.—Eng. News, Apr. 22, '82.

D 28. **RICHFORD,** Tioga Co. (1,267, town.) Built in '95 by Richford Water-Works Co.; supplies 8 families. Supply, Springs, by gravity to reservoir, 60 to 70 ft. head. Reservoir, cap., 12,500 galls.; 14 × 20 ft., × 6 ft. deep. Mains, 1 mile, 2-in. w. i. Taps, 22. Services, ¾-in. Cost, $1,000. No debt. Prest., H. S. Finch; Secy., C. R. Finch; Treas., C. H. Swift; Supt., C. W. Finch. Rept. by Supt., Jan. 18, '97. No sewers.

264. **RICHMONDVILLE,** Schoharie Co. (663.) Built by village; put in operation Jan. 1, '94. Engr., E. D. Smalley, Syracuse. SUPPLY.—Springs, by gravity from storage reservoir. DISTRIBUTION.—Taps, 100; made by consumer. Hydrants, 35. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 65 to 110 lbs. FINANCIAL.—Cost, $28,000. Revenue: Consumers, unmetered, $800; City, none. MANAGEMENT.—Prest., A. J. Wharton; Treas., J. C. Smith; Collector, R. H. Barringer. Rept. by Collector, Nov. 16. SEWERS.—None.

265. **RIPLEY,** Chautauqua Co. (2,020, town.) Built in '95 by Ripley Water Supply Co.; put in operation Dec. 1. Engr., E. A. Wilder, Fredonia. FRANCHISE.—99 yrs. No compensation for public service. SUPPLY.—Springs (by gravity ?). FILTERS.—Sand, patented by E. A. Wilder, Fredonia. RESERVOIRS.—Cap., 3,100,000 galls.; impounding, 3,000,000; distributing, 100,000. DISTRIBUTION.—Mains, 3 miles. Taps, 40. Services, galv. i.; paid for by consumer. Meters, 0. Co. cannot compel use of meters. Hydrants, public, 28. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $12,000, to Feb. 1, '96. Cap. Stock: Authorized, $15,000; paid-up, $11,950. No bonds. Revenue: City, fire protection, $1,000; street sprinkling, $300. MANAGEMENT.—Prest., J. M. Wettin; Secy., F. N. Randall; Treas., J. W. Burrows. Rept. by Secy., June 10. SEWERS.—None.

266. **RIVERHEAD,** Suffolk Co. (4,010, town.) Owned by J. R. & J. H. Perkins and T. M. Griffing; put in operation in '92. SUPPLY.—6-in. flowing well, pumping to tank. PUMP.—Cap., 250,000 galls.; Knowles. TANK.—Cap., 76,000 galls.; wood. DISTRIBUTION.—Taps, 40; made by Co. for $3. Meters, 0. Hydrants, public, 12; private, 2. CONSUMPTION.—(Galls.) av., 50,000; max., 25,000. PRESSURE.—Ordinary, 30 lbs.; fire, 65 lbs. Steam fire engines are used. FINANCIAL.—Cost, $25,000. No debt. Expenses: Operating, $450. Revenue: City, fire protection, $275; street sprinkling, $75. MANAGEMENT.—Prest., John R. Perkins; Secy., Geo. M. Vail; Treas., T. M. Griffing. Rept. by Prest., Nov. 14. SEWERS.—Partial system of sanitary sewers.

267. **ROCHESTER,** Monroe Co. (138,896.) Built in '72-6 by city. SUPPLY.—Two independent sources: Hemlock Lake, 20 miles south of city, affording general domestic gravity supply to entire city; Genesee River, furnishing impure water for fire and power purposes by means of Holly system of direct pumping to central and manufacturing districts of city. Hemlock Lake has area of about 3 sq. miles and drainage area of 43.05 sq. miles. CONDUITS.—Old: 36 and 24-in., w. i. and c. i., about 20 miles long. New: Divided in 3 main parts; the intake crib and pipe, the masonry conduit, and the riveted steel pipe conduit. Masonry conduit is about 11,900 ft. long and of horse-shoe shaped cross-section, 6 × 6 ft. inside; 7,400 ft. of this conduit was tunneled through shale. The steel conduit is 138,275 ft. or 26.19 miles long; 136,954 ft. is 38-in. steel pipe and 1,312 ft. is 36-in. cast-iron and specials. PUMPS.—Cap., 7,000,000 galls. Holly, 1—8,000,000 quadruplex, and 2—2,000,000 hor. water power. Bituminous coal used; av. cost, $2.75 per short ton. RESERVOIRS.—Cap., 88,500,000 galls. Rush storage: 66,000,000; nine miles from city; Mount Hope distributing: 22,500,000; at southern city line; ¾ mile from city hall. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 265 miles (Hemlock system 246½, Holly system 18½); cost extensions met by annual appropriations from general tax levy. Taps, 28,420; made by city at from $2 to $4. Services, lead; paid for by property owner or consumer. Meters, 5,157; owned by city and consumer; controlled by city; repairs paid by city, generally. Use of meters compulsory for manufacturers, commercial buildings and large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 2,578; private, very few. CONSUMPTION.—(Galls.) av.: Hemlock, 9,000,000; Holly, 2,000,000. Max.: Hemlock, 10,000,000; Holly, 3,000,000. Min.: Hemlock, 8,000,000; Holly, 1,123,000. PRESSURE.—Ordinary: Hemlock, 45; Holly, 60 lbs. Fire: Holly, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $6,918,108. Bonded debt, $3,592,000, at 7%, due 1904-5; $300,000, at 4%, due 1943; $1,450,000, at 3½%, due 1942-3; $250,000, at 3½%, due 1914. Sinking Fund: $130,000 (applicable to payment

of entire bonded debt of city. No special fund yet established for water-works). Expenses: Operating, $82,560 for 9 mos. in '95; int., $322,940, for '96. Revenue, $400,000: Consumers, $300,000; City, all purposes, $100,000. Deficits are of rare occurrence, met by general taxation. MANAGEMENT.—Executive Board. Clk., Thos. J. Neville; Supt. and Engr., E. Kuichling; Ch. Pump. Engr., Jas. H. Glavey. Rept. by Supt., Aug. 25. PROJECTED IMPROVEMENTS.—New distributing reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, June 11, '81; Hemlock Lake, June 2, Dec. 29, '92, Apr. 11, '95, illus. and inset; pressure regulator Dec. 1, '92; overflow tower and submerged pipe, Apr. 11, '95, illus. and inset; 38-in. steel conduit, Apr. 30, '96.

103. **ROCKAWAY BEACH,** Queens Co. (1,502.) Supply from Far Rockaway.

103. **ROCKAWAY PARK,** Queens Co. Supply from Far Rockaway.

— ?. **ROCKLAND,** Sullivan Co. (2,868, town.) Press rept., Oct., '93, stated works nearly completed. Rept. from A. B. N. Hull, Town Clk., Dec., '96, gave W. H. Cowan, Montgomery, as person to address regarding works. Utica Pipe Foundry Co. rept. it furnished pipe for works here.

268. **ROCKVILLE CENTRE,** Queens Co. (Est., 1,948.) Built by village; put in operation Jan. 1, '96. Engr., Winfield Davison. Contr., L. J. Richardson, Owego. SUPPLY.—Driven wells, pumping to stand-pipe; two wells, 50 ft. deep, each supplying 250,000 galls. daily. PUMPS.—Cap., 500,000 galls; Worthington high pressure dup. STAND-PIPE.—Cap., 235,000 galls.; iron, 20 × 100 ft. DISTRIBUTION.—Mains, 5 miles; cost extensions met by revenue. Taps, 120; made by village for $2.50. Services, lead; paid for by owner. Hydrants, 49. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary, 42 lbs. FINANCIAL.—Cost, $25,600. MANAGEMENT.—Prest., Chas. W. Hayes; Secy., E. Seabury; Treas., Edwin Wallace; Supt. and Ch. Pump. Engr., G. H. Dennis. Rept. by Winfield Davison, Nov. 24.

269. **ROME,** Oneida Co. (14,991.) Built in '73 by city. SUPPLY.—Mohawk River, pumping to reservoir and direct in case of fire. PUMPS.—Cap., 5,000,000 galls.; Lang; 2—2,500,000 water-power. RESERVOIR.—Cap., 10,000,000 galls.; 60 ft. above pumps. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 17 miles; cost extension met by receipts. Taps, 1,600; made by consumer. Services, lead; paid for by consumer. Meters, 0. Use of meters optional with city. Hydrants, 185. CONSUMPTION.—(Galls.) av., 2,652,976. PRESSURE.—Ordinary, 30 lbs.; fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $175,000. Bonded debt, $160,000, at 3½%. Expenses, $15,211: Operating, $3,994; int., $11,217. Revenue: Consumers, $21,812. MANAGEMENT.—Prest., W. J. P. Kingsley, Mayor; Secy. and Supt., H. S. Wetherbee. Treas., K. S. Putnam; Ch. Pump. Engr., Wm. N. Mott. Rept. by Supt., June 9. SEWERS.—In process of construction. REFERENCE.—Eng. News, Oct. 1, '81.

166. **RONDOUT,** Ulster Co. See Kingston.

270. **ROSENDALE,** Ulster Co. (1,706.) Built in '96 by Rosendale Water-Works Co.; put in operation July 1. Engr., B. H. Brevoort, Poughkeepsie. Contr., W. Sammons. FRANCHISE.—50 yrs. from '94 (charter?). City to pay $890 per yr. for public service; contract for 10 yrs. SUPPLY.—Springs, 315 ft. above town by gravity. RESERVOIR.—Cap., 7,000,000 galls.; storage. DISTRIBUTION.—Taps, 74; made by Co. for $6. Services, galv. i.; paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 35; private, 5. PRESSURE.—Fire, 130 lbs. FINANCIAL.—Cap. Stock: Authorized, $25,000; all paid-up. Bonded debt, $25,000, at 5%; due, 1915. MANAGEMENT.—Prest., and Supt., W. Sammons; Secy., W. B. Snyder; Treas., J. S. Dockstader. Rept. by Supt., Nov. 14. SEWERS.—None.

271. **ROUND LAKE,** Saratoga Co. (Est., 189.) Built in '87 by Round Lake Association. SUPPLY.—Springs, by gravity to two storage reservoirs, thence pumping to tanks. TANKS.—Cap., 70,000 galls.; two on hill 90 ft. above pumps. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 2 miles. Taps, 150. Meters, 0. Hydrants, 14. PRESSURE.—Ordinary (in '89), 50 lbs. FINANCIAL.—Cost, $15,000. No debt. Expenses, $300. Revenue, $1,600. MANAGEMENT.—Prest., Rev. Wm. Griffin; Cor. Secy., Rev. H. C. Farrar; Treas., Hon. Geo. West. Rept. by Supt. J. D. Rogers. PROJECTED IMPROVEMENTS.—Increased supply. Press rept., Oct., '96, stated contract had just been let for new supply. NOTE.—No report as to distribution and financial since '90-1 Manual.

272. **ROUSES POINT,** Clinton Co. (1,856.) Built by village; put in operation Jan., '90. Engrs., Peck & Co., Watertown. Contrs., Brown Bros., Syracuse. SUPPLY.—Lake Champlain, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Worthington. Bituminous coal used; av. cost, $4.50 per short ton. STAND-PIPE. — Cap., 148,000 galls. steel, 15 × 112 ft. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by bonds. Taps, 287; made by village, free. Services, galv. i.; paid for by village to sidewalk. Meters: 15; owned and repaired by consumer; controlled by village. Use of meters optional with consumer, except compulsory for hotels. Hydrants, public, 62; private, 4. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 35 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $38,000. Bonded debt, $38,000, at 4%. No sinking fund. Expenses, $4,820: Operating, $3,300; int., $1,520. Revenue: City, none except for sewer flushing, $2 per flush. MANAGEMENT.—Prest., S. H. Newton; Secy., Jas. W. Collopy; Treas., L. E. Bowron. Rept. by Supt. Chas. W. Weeks, July 29. SEWERS.—Partial system of storm sewers only. REFERENCE.—Laying pipe under water, Eng. News, May 3, '93.

273. **ROXBURY**, Delaware Co. (2,272, town.) Built in '90 by Roxbury Village Water Co.; put in operation Nov. 1. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. Village to pay $15 each for 22 hydrants for 10 yrs.; contract expires Nov. 1, 1905. SUPPLY.—Springs, by gravity to reservoir. RESERVOIR.—Cap., 224,400 galls.; 50 × 50 ft. × 12 ft. deep; bottom 200 ft. above village. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 3 miles. Services, lead and iron; paid for by property owner. Meters: 2; owned by property owner; controlled by Co.; repairs paid by property owner. Use of meters optional with consumer. Hydrants, 22. PRESSURE.—Ordinary, 90-108 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock: Authorized, $20,000; all paid-up. Revenue, City, fire protection and street sprinkling, $330. MANAGEMENT.—Prest., Chas. G. Keator; Secy., Jas. R. Dart; Treas., E. F. Bouton. Rept. by Supt. Arthur F. Bouton, June 5. SEWERS.—None.

252. **RYE**, Westchester Co. See Port Chester.

274. **SAG HARBOR**, Suffolk Co. (Est., 3,210.) Built in '89 by Sag Harbor Water Co. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington; a comp. non-cond. and a simple high pressure. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft. FISCAL YEAR CLOSED Dec. 1. DISTRIBUTION.—Mains, 5 miles. Hydrants, 33. FINANCIAL.—Cost, $45,000. Cap. Stock: Authorized, $60,000; paid 1% div'd in '95. Bonded debt, $45,000, at 6%. MANAGEMENT.—Prest., Henry F Cook; Secy. and Gen. Mgr., John Sherry; Treas., Geo. E. Fahys, 54 Maiden Lane, N. Y. City. Rept. by Secy., Oct. 1.

275. **SAINT JOHNSVILLE**, Montgomery Co. (1,263.) First works built in '79 by village for domestic supply; put in operation Nov. 1, '93, as complete system. Engr. for new works, F. B. Towman, Lowville. Contrs., Small & Gallo, N. Y. City. SUPPLY.—Springs and driven wells, by gravity. Cap., 500,000 galls. daily. RESERVOIR.—Cap., 1,000,000 galls.; distributing. DISTRIBUTION.—Mains, 11 miles. Taps, 450; made by village for $3 per family. Services, iron; paid for by consumer. Hydrants, 56. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $45,000, at 4½ and 4%; due $1,000 each yr. Revenue, $3,840: Consumers, $1,600; Village, fire protection, $2,240. Tax to pay one $1,000 bond is levied each year. MANAGEMENT.—Prest., Otis Williams; Secy., Harley Folmsbee; Treas., F. S. Mosher; Supt., Arch. Allen. Rept. by Prest., June 5. SEWERS.—None. REFERENCE.—Eng. News, Mar. 8, 84.

F 2. **SAINT REGIS FALLS**, Franklin Co. (1,210.) Built by town for fire protection only. Engrs., F. W. Smith and A. M. Courrier. Supply, St. Regis River, pumping direct. Two steam and one water power pumps. Mains, 1 mile; iron. Hydrants, public, 12. Cost, $2,000. Supervisor, W. T. O'Neil; Supt., F. W. Aldrich. Rept. by Wm. H. Flack, Jan. 18, '97.

276. **SALAMANCA**, Cattaraugus Co. (3,692.) Built in '81 by Salamanca Water-Works Co. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,500 for public service. SUPPLY.—Springs and surface water, by gravity; pumping to reservoir in dry weather. PUMPS.—Cap., 1,600,000 galls.; Snow comp., 1,500,000; Gordon & Maxwell, 100,000 (A 1,600,000 Deane comp. dup. rept. by maker as added in '92.) Gas used as fuel. RESERVOIRS.—Cap., 2,000,000 galls.; two storage, 1,500,000 and 500,000. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by selling bonds. Taps, 400; made by consumer. Services, galv. i.; paid for by owner. Meters, 0. Use of meters optional with consumer. Hydrants, 50. PRESSURE.—Ordinary, 70 lbs.; fire, 85 lbs. Steam fire engines are occasionally used. FINANCIAL.—Cost, $40,000. Cap. Stock (in '90), $20,000. Bonded debt (in '90), $20,000, at 6%. Expenses (in '90), total, $2,811. Revenue (in '90), $3,825: Consumers, $2,475; City, $1,350. MANAGEMENT.—Prest., Hudson Ansley; Secy. and Treas., H. O. Wait. Rept. by Supt., A. H. Krieger, July 20. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 1, '82.

277. **SANDY CREEK**, Oswego Co. (723.) Built by village; put in operation Jan. 1, '92. Engrs., Hinds, Moffett & Clark Co., Syracuse. Contr., Chas. Miller, Saratoga Springs. SUPPLY.—Brook, by gravity, from impounding reservoir. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Feb. 28, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by taxation. Taps, 200; made by village for $1. Services, ¾-in. galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 21; private, 1. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 95 lbs. FINANCIAL.—Cost, $17,000. Debt, $16,775: Floating, $775, at 6%; Bonded, $16,000, at 4%; due in 1911. Expenses, $762: Operating, $75; int., $687. Revenue: City, fire protection, $36. MANAGEMENT.—Prest., J. F. Baldwin; Secy., M. J. Salisbury; Treas., A. E. Sherman; Supt., C. W. Colony. Rept. by Treas. SEWERS—Has sanitary and storm sewers.

278. **SANDY HILL**, Washington Co. 2,895.) Built in '88 by Spring Brook Water Co. FRANCHISE.—Unlimited. Press rept., Feb. 20, '95, stated village had just made 5-yr. contract with Co. for public service at $2,750 per yr. SUPPLY.—Brook, fed by springs, pumping to stand-pipe. Dy. cap. of Brook, 750,000 galls. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. non-cond. RESERVOIRS.—Press rept., June, '95, stated Co. would soon construct a 1,000,000-gall. reservoir and connect it with old one. STAND-PIPE.—Cap., 228,360 galls.; 18 × 120 ft., steel; gives a head of 161 ft. FISCAL YEAR CLOSED June 14. DISTRIBUTION.—Mains, 6¾ miles. Taps, 200.

Meters: 40. Hydrants, 41. CONSUMPTION.—(Galls.) av., 125,000. PRESSURE.—Ordinary 50 lbs.; fire, 50 to 70 lbs. FINANCIAL.—Cost, $80,000. Cap. Stock: Authorised, $30,000; all paid-up. Bonded debt, $40,000, at 5%; due in 1909. Expenses, $5,251: Operating, $2,160; int., $2,658; taxes, $433. Revenue, $5,262: Consumers, $2,700; City. $2,562. MANAGEMENT.—(Press rept. of election, June, '96.) Prest., Loren Allen; Secy., T. M. Ingalsbe; Treas., Chas. F. Beach. NOTE.—No official report since '90-1 Manual.

279. **SARANAC LAKE,** Franklin Co. (768.) Built by village; put in operation in '96. Engr. and Contr., W. H. Lang, Burlington, Vt. SUPPLY.—Saranac River, pumping to reservoirs. PUMP.—Lang. RESERVOIRS.—Cap., 1,500,000 galls.; 2—750,000 distributing. DISTRIBUTION.—Mains, 2 miles; cost extensions met by rentals. Taps, 200; made by village. Services, paid for by village. Meters, 0. Hydrants, 50. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $40,000. Debt, $38,000, at 4½%. Expenses, $2,320: Operating, $420; int., $1,900. Deficits are met by taxation. MANAGEMENT.—Prest., J. C. Russell; Secy., W. A. Walton; Treas., R. H. McIntyre; Ch. Pump. Engr., R. E. Woodruff. Rept. by Secy., Nov. 16. SEWERS.—Has sanitary and storm sewers.

280. **SARATOGA SPRINGS,** Saratoga Co. (11,975.) Built in '71 by village. SUPPLY.—Loughberry Lake, pumping direct. Lake has area of 96 acres, depth of about 20 ft., is 336 ft. above sea level and fed by springs. Town is from 220 to 400 ft. above sea level. PUMPS.—Cap., 13,000,000 galls.; 5,000,000 and 8,000,000 Holly-Gaskill hor. high duty. Anthracite coal used. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 35 miles. Taps, 3,000. Meters, 60. Hydrants, 250. CONSUMPTION.—(Galls.) av., 3,500,000. PRESSURE.—Ordinary (in '89), 95 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $330,000. Bonded debt, $214,000, at 3½, 4 and 5%. Expenses, $25,500: Operating, $15,000; int., $10,500. Revenue: Consumers, $41,500. MANAGEMENT.—Comrs.; Chn., Adelbert P. Knapp; Secy. and Supt., Amos S. Browne. Rept. by Supt., Dec. 21. SEWERS.—Has sewers. REFERENCE.—Eng. News, Sept. 24, '81; Holly-Gaskill pumps, Apr. 26, '84.

281. **SAUGERTIES,** Ulster Co. (4,287.) Purchased by village Jan. 1, '96. Built in '87 by Saugerties Water Co. Press repts. state that there was a dispute between Co. and village regarding hydrant rental, village claiming no contract had ever been made, and refusing to pay for service. Also that in Jan., '93, Co. shut off water from hydrants. SUPPLY.—Platterkill Creek and springs, by gravity. RESERVOIRS.—Small distributing, located at West Saugerties. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 13.5 miles; cost extensions met by tax if revenue is not sufficient. Taps, 396; made by village for $8, up to and including ¾-in. tap. Services, iron or lead; paid for by owner. Meters: 5; owned by consumers, one by village; repairs paid by owner. Use of meters compulsory for factories. Village can be compel use of meters and any consumer may have one. Hydrants, public, 54; private, 5. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 to 100 lbs. One steam fire engine is used. FINANCIAL.—Bonded debt, $78,000, at 4%. Deficits are fully met by taxation. MANAGEMENT.—Prest., Geo. W. Washburn; Secy., Howard C. Bogardus; Treas., Geo. Seamon. Rept. by Supt., S. Yates Knight, June 8. SEWERS.—None.

28. **SAYVILLE,** Suffolk Co. See Bay Shore.

282. **SCHENECTADY,** Schenectady Co. (19,902.) Bought by city in '85; built by Schenectady Water Co. in '71. Engrs. for improvements, '95-6, Stanwix Engineering Co., Rome, N. Y. SUPPLY.—Covered well and Mohawk River, pumping to stand-pipe. This is a new supply, which, it was expected, would be put in operation Dec. 1, '96. PUMPS.—Cap., 12,000,000 galls.; 2—6,000,000 Deane vert. triple exp. At old pumping station there were two Holly-Gaskill hor. high duty pumps, 5,000,000 and 3,000,000, and a 2,000,000 Dean; not stated whether these are held in reserve. Bituminous coal used; av. cost, $2.60 per short ton, delivered. STAND-PIPE.—Cap., 602,000 galls.; steel, 82 × 100 ft., enclosed in masonry tower 146 ft. high. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 28 miles; cost extensions met by sale of bonds. Taps, 2,856, made by city: fee, ⅛-in. for $6, ¾-in. for $9 and 1-in. for $12. Services, lead; paid for by property owner. Meters, 8; owned, controlled and repaired by city. Use of meters optional with consumer. Hydrants, public, 256; private, 45. CONSUMPTION.—(Galls.) av., 4,750,000; max., 6,000,000; min., 4,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. One steam fire engine is used. FINANCIAL.—Cost, $415,000. Bonded debt, $362,000, at 4%; $73,000 at 3%. Sinking Fund: $38,000, invested in trust co. at 2½%. Expenses: Operating, $29,607; int., $16,670. A fire tax of 2¾ mills is levied on all property within 1,000 ft. of a fire hydrant. MANAGEMENT.—Prest., E. Nott Schermerhorn; Secy., Geo. T. Bradt; Treas., H. W. Denington; Supt., Geo. T. Ingersoll; Ch. Pump. Engr., Walter Chubb. Rept. by Supt., June 24. PROJECTED IMPROVEMENTS.—Replacing four miles of old cement-lined mains with large cast iron pipe and 66 new fire hydrants. SEWERS.—Has sanitary and partial system of storm sewers. REFERENCES.—Eng. News, Mar. 11, '82; stand-pipe specifications, May 30, '95.

283. **SCHENEVUS,** Otsego Co. (665.) Built in '88 by Schenevus Village Water-Works Co. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. Contract for five years from Nov., '95, at $25 per hydrant per yr. SUPPLY.—Springs, by gravity from reservoir. FILTER BED.—

Gravel and sand; 10 ft. deep. RESERVOIRS.—Impounding, small; storage, 10,000,000 galls. FISCAL YEAR CLOSED Jan. 14. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income mainly. Taps, 75; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 15. CONSUMPTION. — (Galls.) av., 300,000. PRESSURE. — Ordinary and fire, 120 lbs. FINANCIAL. — Cost, $30,000. Cap. Stock: Authorized, $7,500; all paid-up. Bonded debt, $18,000, at 5%; due 1902. Expenses: Operating, $200. Revenue: City, fire protection, $350. MANAGEMENT.—Prest., C. H. Graham; Secy. and Treas., Lottie A. Field. Rept. by Supt., M. E. Baldwin, June 5, '96. PROJECTED IMPROVEMENTS.—Pumping plant for dry weather.

284. **SCHOHARIE,** Schoharie Co. (1,028.) Built in '90 by Schoharie Water Co.; put in operation Dec. 1. SUPPLY.—Springs and streams, by gravity to storage reservoir. RESERVOIR.—Cap., 10,000,000 galls. DISTRIBUTION.—Mains, 1½ miles. Taps, 186. Hydrants, 9. FINANCIAL.—Cost, $10,500. MANAGEMENT.—Rept. by Supt., Chas. C. Kromer, Aug. 26.

285. **SEA CLIFF,** Queens Co. (Est., 1,000.) Built in '72 by Sea Cliff Grove & Metropolitan Camp Ground Assoc. of New York and Brooklyn. First supply was principally or wholly for grounds of Assoc. CONTRACT.—Press repts. state that Co. contracted with village of Sea Cliff to furnish water for 25 hydrants and for street sprinkling for five yrs. from July, '94; also that improvements to works were made in '92-3 to enable Co. to furnish this service. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Blake and Worthington, latter 350,000-gall. simple high pressure. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft. Press rept. states this was built in '93; Contrs., Tippett & Wood, Phillipsburg, N. J. DISTRIBUTION.—Mains (in '87), 5 miles. Hydrants (press rept., '93), 25. NOTE.—No official rept. since '88.

286. **SENECA FALLS,** Seneca Co. (6,116.) Built in '87 by Seneca Falls Water Co. Press rept., Feb., '95, stated these works were to be reorganized and consolidated with Waterloo plant. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Unofficially rept. in '95, that 5-yr. contract was about to be made for 75 hydrants at $40 each. SUPPLY.—Cayuga Lake, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; comp. vert. STAND-PIPE.—Cap., 423,000 galls.; 80 × 80 ft. Press rept. in '95 stated height was to be increased. DISTRIBUTION.—Mains, 12 miles. Taps, 400. Meters, 0. Hydrants, public, 76 (?); see above, under franchise. FINANCIAL.—Withheld. MANAGEMENT.—(Press rept., Oct. 30, '96.) Prest., H. M. Smith, Boston; Treas., W. F. Ross, Rochester. NOTE.—No official rept. since '90-1 Manual. REFERENCES.—Stand-pipe failure, Eng. News, Nov. 5, '87, Oct. 6, '88, Mar. 16, '93, Apr. 26, '94.

86. **SHEEPSHEAD BAY,** Kings Co. See Brooklyn.

287. **SHERBURNE,** Chenango Co. (960.) Built in '83 by village; supplies Sherburne Quarter. SUPPLY.—Springs and brooks, by gravity from impounding reservoir. Drainage area, about 5 sq. miles. RESERVOIR.—Cap., 23,000,000 galls. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by rentals. Taps, 300; made by village for $6 to $10. Services, galv. i.; paid for by consumer to curb. Meters, 0. Use of meters optional with consumer. Hydrants, public, 25; private, 1. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $30,000, at 8½%. No sinking fund. Expenses: Operating, $200. MANAGEMENT.—Prest., Jesse H. Shepard; Secy., L. A. Van Wagner; Treas., John H. O'Brian. Rept. by Supt., W. E. Davis, Nov. 16. SEWERS.—None. REFERENCE.—Eng. News, Oct. 25, '84.

287. **SHERBURNE QUARTER,** Chenango Co. (Est., 500.) Supply from Sherburne.

288. **SHERMAN,** Chautauqua Co. (785.) Built in '96 by Sherman Water-Works Co.; put in operation Sept. 1. Engrs., Flint Walling Mfg. Co., Kendallville, Ind. SUPPLY.—Well and springs, pumping to tank. PUMPS.—Wind engine and steam. TANK.—Cap., 15,750 galls.; on steel trestle 70 ft. high. DISTRIBUTION.—Hydrants, public, 3; private, 7. FINANCIAL.—Cost, est., $2,500. Cap. Stock: Authorized, $10,000; paid-up, $2,500. MANAGEMENT.—Prest., C. H. Corbett; Secy., C. E. Sheldon; Treas., W. J. Corbett; Supt., F. Conish. Rept. by Prest., Sept. 12. SEWERS.—None.

289. **SIDNEY,** Delaware Co. (1,358.) Built in '89 by Sidney Water-Works Co. Press rept., Oct., '96, stated 5-yr. hydrant contract had just expired and vote would probably be taken soon on renewal. SUPPLY.—Mountain stream, by gravity from impounding and distributing reservoirs. FILTERS.—At distributing reservoir; sand. RESERVOIRS.—Cap., 10,000,000 galls.; about two miles from village and 1,000 ft. apart. Press rept., Nov., '94, stated new 20,000,000-gall. reservoir was under construction. DISTRIBUTION.—Mains, 7½ miles. Taps, 235. Hydrants, 41. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary (in '89), 95 lbs. FINANCIAL.—Cost (in '90), $33,000. Cap. Stock: Authorized, $90,000. Bonded debt, $15,000, at 4%; $5,000, due in '99, in 1904, and in 1909. Expenses, $1,800: Operating, $400; int., $600; taxes, $800. Revenue, $3,250: Consumers, $2,200; City, fire protection, $1,050. MANAGEMENT.—Prest., H. W. Clark; Secy., John A. Clark; Supt., W. E. Barker.

290. **SILVER CREEK,** Chautauqua Co. (1,678.) Built in '96 by village. Engr., J. F. Witmer, Buffalo. Contrs., Prout & Swanson, Jamestown. SUPPLY.—Wheeler

Brook, by gravity. DISTRIBUTION.—Mains, 14 miles. Hydrants, 66. PRESSURE.—Ordinary, 130 to 166 lbs. FINANCIAL.—Contract price, $28,205. MANAGEMENT.—Comrs. NOTE.—Information from press repts.

53. **SILVER SPRINGS,** Wyoming Co. (Est., 600.) See Castile.

291. **SINCLAIRVILLE,** Chautauqua Co. (510.) Built in '92 by Co.; in '96 Sinclairville Water-Works Co. was incorp. SUPPLY.—Springs and brook, by gravity. FINANCIAL.—Cap. Stock, authorized, $10,000. MANAGEMENT.—Directors (Jan. 24, '96): Horace H. Crary, Chas. J. Knapp and others, Binghamton. NOTE.—Above from press repts.

292. **SING SING,** Westchester Co. (9,352.) Built in '88-9 by village. SUPPLY.—Indian Brook, pumping from impounding to distributing reservoir. PUMPS.—Cap., 2,400,000 galls. Low service: 2,000,000 Loretz high duty, vertical comp. cond. and fly-wheel. High service: Two Lorets water engines, operating double-acting pumps, combined cap., 400,000; power from low service mains. (A 1,230,000 comp. dup. rept. by maker as added in '92.) Pittston coal used; av. cost, $5 per short ton, delivered. RESERVOIRS.—Cap., 117,000,000 galls.; impounding, 100,000,000; formed by dam across Indian Brook, a short distance east of the old Croton aqueduct; area, 18 acres; 17 ft. deep. Distributing, 17,000,000; about 3 miles south of village and 327 ft. above tide water. STAND-PIPE.—Cap., 100,000 galls.; 430 ft. above tide. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 14¾ miles; cost extensions met by income. Taps, 850; made by consumer for $1. Services, lead; paid for by owner. Meters, 550; owned by consumer and village; controlled and repaired by village; yearly rental, 10%. Use of meters compulsory for those consumers having water closets. Village can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 1. PRESSURE.—Ordinary, varies. Steam fire engines are sometimes used. FINANCIAL.—Cost, $300,000. Bonded debt, $290,000, at 4%. MANAGEMENT.—Prest., Isaac Secor; Secy., S. M. Sherwood; Treas., G. M. Todd; Supt., James Bedell. SEWERS.—Has sanitary and storm sewers.

293, P 11. **SKANEATELES,** Onondaga Co. (1,559.) Built in '90 by Skaneateles Water-Works Co.; put in operation Dec. 15. FRANCHISE.—Village was to pay $30 per yr. per hydrant for 5 yrs.; contract expired. LEGAL DIFFICULTIES.—See below. SUPPLY.—Skaneateles Lake, pumping to stand-pipe; not filtered. PUMPS.—Cap., 1,000,000 galls. Barr; works against 200 ft. head. STAND-PIPE.—Cap., 94,000 galls.; 20 × 40 ft. DISTRIBUTION.—Mains, 6 miles. Hydrants, 40. PRESSURE.—Ordinary, 20 to 80 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock: Authorized, $40,000; all paid-up. Bonded debt, $40,000, at 6%. MANAGEMENT.—Prest., Jno. W. Hawley; Secy., L. S. Allen; Supt. and Engr., Jno. A. Burton. Note.—Above is from '90-1 Manual, except names of officers, which were rept. by Supt., Sept. 30. Owing to legal difficulties Co. deemed it best not to make further rept.

PROPOSED MUNICIPAL PLANT.

Contract with Co. for hydrant rental expired Feb., '96. Co. would not renew at old price (see above) nor at max. price ($40) claimed by village as fixed in franchise. Village voted bonds to buy or build works about May, '96, and offered Co. $24,000 for plant. Later, contract for works was let to Jno. Marsden, Utica, for $21,260. Oct., '96, Court refused Co. preliminary injunction restraining village from building works. Jan. 21, '96, Stanwix Engineering Co., Rome, N. Y., rept. it was Engr. for new village works "now under construction."

—? **SLOATSBURG,** Rockland Co. (Est., 500.) Small gravity works built by Co. Supply, Negro Pond. Address Geo. & Frank Pierson, Ramapo. Rept. by Jas. S. Haring, Nyack, Jan. 23, '97.

294. **SOLVAY,** Onondaga Co. (563.) Built in '95 by village. SUPPLY.—Wells, pumping to reservoir. Two wells, one 7 ft. sq., 4 ft. deep; one 23 × 25 ft. PUMP.—Cap., 750,000 galls.; Deane comp. cond. dup. RESERVOIRS.—Cap., 2,500,000 galls.; on Jerome Hill. FINANCIAL.—Cost, $60,000. Bonded debt, $60,000. Revenue: Consumers, $1,231. MANAGEMENT.—Trustees. Prest., Wm. Tanner; Secy. and Treas., F. M. Power. SEWERS.—Has sanitary sewers. NOTE.—Above taken from press rept., including abstract of official rept. on financial operations of works.

295. **SOUTHAMPTON,** Suffolk Co. (Est., 1,300.) Built in '94 by Southampton Water-Works Co.; put in operation June 15. Engr. and Contr., Oscar Darling, Babylon. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Three 8-in. driven wells, 72 ft. deep, water rises 50 ft., pumping to tanks. PUMPS.—Cap., 1,500,000 galls.; 2 750,000 Worthington; a simple high pressure and a vert. comp. non-cond. TANKS.—Total cap., 39,000 galls.; three air-tight multiple compression steel tanks, underground, built on brick arches and connected direct on mains; 45 ft. long, 6½ ft. in diam.; cap., 13,000 galls. each. FISCAL YEAR CLOSED June 15. DISTRIBUTION.—Mains, not given; cost extensions met by stock. Taps, made by Co. at $6, $8 and $10. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 63; private, 2. CONSUMPTION.—(Galls.) av., 90,000; max., 340,000; min., 30,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $64,700. Cap. Stock: authorized, $75,000; paid-up, $64,700; paid 5% div'd in '96. No preferred stock

or debt. Expenses, $3,745: Coal, $1,044; wages, $1,405; taxes, $157; sundries, $1,139. Revenue, $7,309: Consumers, unmetered, $5,176; City, fire protection, $1,733; street sprinkling, $400. MANAGEMENT.—Prest., J. W. Kilbreth; Secy. and Treas., J. H. Pierson; Supt., R. G. Hart; Ch. Pump. Engr., C. M. Weeks. Rept. by Prest., Nov. 28. SEWERS.—None.

296. **SOUTH GLEN FALLS,** Saratoga Co. (1,606.) Built in '96 by village. Engr., Geo. P. Slade. No contr. SUPPLY.—Springs and river, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington dup. RESERVOIRS.—Two; one collecting, one storage; coke filter is located between the two. STAND-PIPE.—Cap., 228,480 galls.; 18 × 120 ft. DISTRIBUTION.—Mains, about 6 miles. Services paid for by property owner. Hydrants, 60. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Prest., Andrew Reidy; Secy., R. McCormick; Treas., A. J. Robinson; Supt., A. J. Keys. Rept. by Prest., Sept. 16. SEWERS.—None.

297. **SPRINGVILLE,** Erie Co. (1,883.) Built in '88 by Springville Water-Works Co. LEGAL DIFFICULTIES.—See note. SUPPLY.—Driven wells, pumping direct; original supply, springs, by gravity to storage reservoir; this supply is held in reserve. PUMPS.—Cap., 1,000,000 galls.; Holly hor. water power. RESERVOIR.—Cap., 375,000 galls.; storage, for emergency. DISTRIBUTION.—Mains, 4 miles. Hydrants, 34. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Frank D. Smith, Receiver, Sept. 30, '96. NOTE.—Franchise was for 25 yrs. and provided village might buy works at any time at actual cost of construction, plus 10%. Apr. 30, '95, people voted to buy works, but limited price to $29,500. Co. claimed works cost about $44,000. Village alleged price was exaggerated, and brought action in Supreme Court to have actual cost determined. Dec. 23, '96, court decided (apparently in this case) that there had been a breach of contract, and awarded village $500 damages. Order returnable Oct. 28, '96, was issued by court to show cause why Co. should not be dissolved. (Press repts.)

298. **STAMFORD,** Delaware Co. (819.) Built in '83 by Stamford Water-Works Co. under 99 yrs. franchise. SUPPLY.—Head-waters of Delaware River, one mile from its source, by gravity from impounding reservoir. Drainage area, 3 sq. miles. FISCAL YEAR CLOSED Jan. 6. DISTRIBUTION.—Mains, 3 miles. Taps, 78. Services, lead. Meters, 0. Hydrants, 16. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $24,500. Cap. Stock, authorized, $20,000; all paid-up; paid no div'd in '90. Expenses, $295: Operating, $59; int., $120; taxes, $116. Revenue, $1,672: Consumers, $1,352; City, $320. MANAGEMENT.—Prest., Jno. C. Van Dyke. NOTE.—No report as to distribution and financial since '90-1 Manual. REFERENCE.—Eng. News, Mar. 28, '85.

299. **STAPLETON AND EDGEWATER,** Richmond Co. (Stapleton, 2,500 est.; Edgewater, 14,265.) Now controlled by Woodbury & Moulton, Portland, Me. Built in '84 by Crystal Springs Water Co. FRANCHISE.—5 yrs. from '92. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes, and there is no compensation for public service. SUPPLY.—Driven wells, pumping to reservoir and tank. PUMPS.—Cap., 4,000,000 galls. Two Deane and one Worthington. Anthracite coal used; av. cost, $3 per short ton. RESERVOIRS.—Cap., 4,000,000 galls.; low services, 250 ft. above tide. TANK.—Cap., 100,000 galls.; on trestle, 50 ft. high; for high service, 418 ft. above tide. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 50 miles; cost extensions met by bonds. Taps, 2,050; made by Co. and services laid to curb for $8. Services, galv. i.; paid for by consumer. Meters, 1,000; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for those consumers having complete fixtures. Co. can compel use of meters and any consumer may have one. Hydrants, public, 305; private, 20. CONSUMPTION.—(Galls.) av., 1,250,000; max., 1,800,000; min., 900,000. PRESSURE.—Ordinary and fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $1,000,000. No preferred stock. Bonded debt, $650,000, at 6%, due 1910, principally. Expenses: Operating, $16,000; taxes, $3,000. Revenue, $60,000. MANAGEMENT.—Prest., W. J. Curtis, 45 Wall St., N. Y. city; Secy. Treas. and Supt., J. B. Newhall; Ch. Pump. Engr., Jas. H. Corson. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers.

300. **STONY POINT,** Rockland Co. (514.) Built in or since '92 by Stony Point Water Co. Engrs., Wm. B. & Jos. B. Rider, South Norwalk, Conn. SUPPLY.—Reservoir on stream, pumping through mains to reservoir. System connected with Haverstraw works; plants under same ownership. PUMP.—Cap., 500,000 galls.; water power. RESERVOIR.—About 100 ft. diam., 10 ft. deep; 170 ft. elev., 1,000 ft. from pump. DISTRIBUTION.—Mains, 4 miles. FINANCIAL.—Cost, about, $40,000. Rept. by J. B. Rider, South Norwalk, Conn., Feb. 25, '97.

146. **SUFFERN,** Rockland Co. (Est., 756.) Supply from Hillburn.

218. **SUSPENSION BRIDGE,** Niagara Co. Annexed to Niagara Falls, which see.

301. **SYLVAN BEACH,** Oneida Co. (Not given.) Built in '94 by Sylvan Spring Water Co. Engrs., Stanwix Engineering Co., Rome. No Contr. SUPPLY.—Springs, by gravity. FINANCIAL.—Cost, $25,000. MANAGEMENT.—Prest., C. C. Clifford; Secy., H. W. Coley, Oneida; Treas., E. E. Coe. Rept. by Prest., July 1, '95.

302. **SYRACUSE,** Onondaga Co. (88,143.) Owned by city since Jan. 1, '92; first supplied from works built by three men in '29. In '49 Syracuse Water Co. built works,

which were sold to city, as above. City has introduced new supply, and laid 105 miles new distributing mains, abandoning practically all of old plant, except 22 out of 40 miles of mains. SUPPLY.—Skaneateles Lake, by gravity. Lake is about 15 miles long and one mile wide; 466 ft. above level of Erie Canal in the city; drainage area, 60.28 sq. miles, exclusive of lake surface. Intake, 54 in. steel pipe, 6,419 ft. long, extending to crib in 40 ft. of water. Supply main, 19¼ miles of 30-in. c. i. pipe. RESERVOIRS.—Cap., 121,000,000 galls.; Woodland distributing, built in '95; two miles from center of city; elev., 221 ft. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 127 miles; cost extensions met by sale of bonds in the past; from revenue in the future. Taps, 7,436; made by city, including service, 1 ft. inside curb line, free. Services, lead; paid for by consumer. Meters, 3,696; owned by consumer; controlled by city; repairs made by city at consumer's expense. Use of meters compulsory for nearly all consumers, except stores and dwellings. City can compel use of meters and any consumer may have one. Hydrants, public, 2,073. CONSUMPTION.—(Galls.) av., 7,500,000. PRESSURE.—For 74 miles of mains, 90 to 100 lbs.; 36 miles, 60, to 90 lbs.; 15 miles, 30 to 60 lbs., and 2 miles less than 30 lbs. Steam fire engines are used at about ¼ of all the fires. FINANCIAL.—Cost, $3,957,879, including $871,843 paid Co. for works. Bonded debt, $3,800,000: $500,000, at 4%; $2,300,000, at 3½%; $1,000,000, at 3%; all due July 1, 1920. No sinking fund. Expenses, Operating, about $140,000; int., $127,875. Revenue, $199,506: Consumers, $45,721; metered, $110,898; City, $40,000; sewer flushing, $122; misc. receipts for labor, material and int., $2,770. MANAGEMENT.—Prest., Henry J. Mowry; Secy., J. B. Brooks; Ch. Engr. and Supt., Wm. R. Hill. Rept. by Supt., June 5, but since revised from annual rept. for '95-6. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Sept. 10, '81; intake, June 15, '93, illus.; municipal ownership, Sept. 14, 21, '93; conduit from Skaneateles Lake to Woodland Reservoir, Dec. 13, '94, illus. and inset.

303. **TARRYTOWN**, Westchester Co. (3,562.) Built in '87 by village. SUPPLY.—Dug wells, pumping to reservoir for low service and to tank for high service. PUMPS.—Cap., 2,250,000 galls.; Worthington comp. cond., 1,000,000 and 1,250,000. A 1,000,000-gall. Laidlaw-Dunn-Gordon pump rept. by maker.) Anthracite pea coal used; av. cost, $3.75 per short ton. RESERVOIRS.—Cap., 1,250,000 galls.; 325 ft. above river. TANK.—Cap., 158,640 galls.; iron, 30 × 30 ft., on Buttermilk hill, 560 ft. above Hudson River. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 20 miles; cost extensions met by bonds. Taps, 600; made by village; $1 charged for tap. Services, galv. i.; paid for by consumer. Meters, 536; owned by consumer; controlled by village; repairs paid by consumer. Use of meters compulsory for all consumers. Hydrants, 134. CONSUMPTION.—(Galls.) av., 300,000; max., 450,000; min., 200,000. PRESSURE.—Ordinary, 75 to 135 lbs. FINANCIAL.—Cost, $173,200. Debt, $173,200: Floating, $29,200; Bonded, $144,000, at 4%; due $3,000 per yr. No sinking fund. Expenses: Operating, $7,796. Revenue: Consumers, $10,536. Village pays bonds as they mature, also that part of interest which board cannot pay. MANAGEMENT.—Prest., D. D. Tallman; Secy., John F. Schall; Treas., Saml. Requa; Supt., D. S. Merritt; Ch. Pump. Engr., Wm. R. Taylor. Rept. by Supt., Sept. 29. PROJECTED IMPROVEMENTS.—Wells so arranged that stored surface water can be filtered into them; impounding reservoir, 200,000,000 galls.; lip of dam, 248 ft. above river, Contrs., Van Vranken & Duell, Engr., D. S. Merritt; high service tank is to be removed and a larger tower erected; new 1,000,000-gall. open reservoir is under construction. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, May 6, '82; siphon, June 22, '93.

304. **THERESA**, Jefferson Co. (1,028.) Built in '96 by village; put in operation April 16. Engrs., Hinds & Bond, Watertown. Contr., F. A. Nims, Philadelphia, N. Y. SUPPLY.—Indian River, pumping to stand-pipe. PUMP.—Cap., 860,000 galls.; Worthington vert. trip. water power. STAND-PIPE.—Cap., 117,000 galls.; 20 × 50 ft. DISTRIBUTION.—Mains, 3¼ miles. Taps, 75; made by village for $5. Services, ¾-in. galv. i., paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 36; private, 1. PRESSURE.—Ordinary, 65 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $19,000. Expenses: Operating, about $600; int., $665. Deficits will be met by taxation. Works have not been in operation for a year yet, cannot give detailed financial information. MANAGEMENT.—Prest., E. J. Stratton; Secy., H. P. Cheesman; Treas., D. G. Wilson; Supt., W. A. Pierce. Rept by Treas., Sept. 10. SEWERS.—Has storm sewers only.

305. **THOUSAND ISLAND PARK**, Jefferson Co. (In summer, est., 3,000.) Built in '85 by Co. SUPPLY.—St. Lawrence River, pumping to tank. TANK.—Cap., 12,800 galls. DISTRIBUTION.—Mains, 1 mile, w. i. Taps, about 150. Meters, 0. Hydrants, not given. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, about $5,000. NOTE.—No report since '90-1 Manual.

306. **TICONDEROGA**, Essex Co. (2,267.) Now owned by village; works built in '75 by Ticonderoga Water-Works Co.; bought by village since '90 and new works built; Engr., Stephen Babcock, Little Falls. SUPPLY.—Trout brook and springs, 400 ft. above village, by gravity. RESERVOIR.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by rentals. Taps, made by village. Services, galv. i.; paid for by consumer. Meters, 1; owned and controlled by village. Use of meters optional with consumer. Hydrants, public, 38. PRES-

SURE.—Ordinary, 150 to 200 lbs. FINANCIAL.—Bonded debt, $75,000, at 4%; due $5,000 in '97; $8,000, in 1902; $10,000, in 1907; $15,000, in 1912, and $17,000, in 1917. Sinking Fund: $4,000. Expenses: Operating, $1,104; taxes, $3,717. Revenue: City, fire protection, $900. MANAGEMENT.—Prest., D. C. Bascom; Secy. and Treas., E. T. Wilcox; Supt., Thos. Halloran. Rept. by Prest., June 8. SEWERS.—Partial systems of sanitary and storm sewers.

307. **TONAWANDA,** Erie Co. (7,145.) Bought by village Aug. 1, '93; built in '87 by Tonawanda City Water-Works Co. SUPPLY.—Niagara River, pumping direct. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Holly-Gaskill hor. high duty. Pittsburg slack coal used; av. cost, $1.65 per short ton. FISCAL YEAR CLOSED Feb. 29, '96. DISTRIBUTION.—Mains, 21 miles; cost extensions met by taxation. Taps, 700; made by village for $9. Services, lead; paid for by consumer. Meters, 12; owned, controlled and repaired by village. Use of meters optional with village; compulsory for manufacturers Just beginning to use meters. Hydrants, public, 275. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $215,000. Bonded debt, $115,000 at 5%; $65,000 at 4%; both due 1914. Expenses, $17,750: Operating, $8,500; int., $9,250. Interest on bonds met by taxation. MANAGEMENT.—Prest., O. H. Gorton; Secy., S. H. Gipp; Treas., A. J. Kropf. Rept. by H. S. Rowley, July 13. SEWERS.—Has sanitary and storm sewers. NOTE.—See North Tonawanda for early history.

308. **TREADWELL,** Delaware Co. (Est., 300.) Built in '85 by Croton Water-Works Co.; put in operation Oct. 1. No engr. nor contr. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 31,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 50. Services, lead. Hydrants, public, 5. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $6,500. Cap. Stock: Common, authorized, $6,500; all paid-up. Debt, $450, at 5%. Expenses: Operating, $25. Revenue: Consumers, $450. MANAGEMENT.—Prest., J. Schermerhorn; Secy., J. C. Van Tassell; Treas., L. Saunders; Supt., E. A. Baldwin. Rept. by Treas., Jan. 19, '97. SEWERS.—None.

309. **TROY,** Rensselaer Co. (60,956.) Built in '33 and rebuilt in '80 by city. Co. was chartered in '29, but did nothing, so town bought its rights for $173. SUPPLY.—Five storage reservoirs in valley of Piscawenkill, by gravity; also Hudson River at Lansingburg, 3 miles above Troy, pumping to one of the storage reservoirs, 231 ft. above river. Piscawenkill has drainage area of 1,363 acres. Force main, 30-in., 16,722 ft. long. PUMPS.—Cap., 12,000,000 galls.; 2—6,000,000 Holly quadruplex. Buckwheat coal used; av. cost, $2.50 per short ton. RESERVOIRS.—Storage: Vanderheyden, Cap., 58,300,000; area, 16.5 acres; 472 ft. above tide. Brunswick, cap., 152,684,000; area, 37 acres; 474.5 ft. above tide. Distributing: Low service, one on west side of Oakland av., cap., 4,000,000; 402 ft. above tide; one on east side Oakwood av., cap., 34,530,000; these two are supplied by Lansingburg pumping works. Middle service, Upper Oakwood, cap., 35,180,000; 290 ft. above tide. High service, cap., 5,000,000; 382 ft. above tide. FISCAL YEAR CLOSED Feb. 29, '96. DISTRIBUTION.—Mains, 59 miles; cost extensions met by income. Taps, 6,741; made by city for $7. Services, iron and lead; paid for by owner. Meters, 269; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, 748. CONSUMPTION.—(Galls.) av., 8,599,977 galls. PRESSURE.—High service, 11 to 107 lbs.; middle service, 9 to 105 lbs.; low service, 11 to 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,268,288; bonded debt, $303,500: $40,000 at 5%, due annually to 1919; $263,500 at 3½ and 4½%; av. rate int., 4%. Sinking Fund: $43,406, held by city chamberlain to pay bonds. Expenses, $75,987: Operating, $64,240; int., $11,747. Revenue, $96,067: Consumers, unmetered, $72,461; metered, $19,320; miscellaneous (repairs, rent, etc.), $4,285. MANAGEMENT.—Prest., Saml. O. Gleason; Clk., Geo. B. Fales; Supt., Edward Dolan; Ch. Pump. Engr., Sifroid Soucy. Rept. by Clk., Aug. 4. SEWERS.—Has storm sewers. REFERENCES.—Eng. News, July 16, '81.

215. **TUCKAHOE,** Westchester Co. (Est., 1,769.) In East Chester town supplied by New Rochelle Water Co., New Rochelle.

310. **TULLY,** Onondaga Co. (498.) Present works built in '95-6 by village. Engr., E. D. Smalley, Syracuse. Contr., Jno. Morrell, Mohawk. Press repts. state village was supplied as early as '92 by gravity works, owned by Co. SUPPLY.—Well, 20 ft. diam., pumping to reservoir. PUMP.—Cap., 500,000 galls.; Deane dup. steam. System was commenced as a gravity plant, but the supply being limited, a municipal electric-lighting plant was built and combined with the water-works. RESERVOIR.—Press rept., Nov., '95, stated that a 1,000,000-gall. reservoir would be built, to provide water for fire purposes. DISTRIBUTION.—Mains, 2½ miles. Taps, (May, '96) over 50. Hydrants, 27. PRESSURE.—80 to 90 lbs. FINANCIAL.—Cost, est., $10,000. MANAGEMENT.—Comrs. Prest., W. L. Earle; Secy., J. M. Slayton; Treas., J. S. Wright. Rept. by Treas., Sept. 3, and from description sent by Engr.

P 12. **TUPPER LAKE,** Franklin Co. (Not given.) Press rept. states Tupper Lake Water Co. organized in Jan., '97, as follows: Prest., E. G. Reynolds; Secy., C. L. King; Treas., C. H. Sisson; also that committee was appointed to secure an engineer.

311. **TUXEDO PARK,** Orange Co. (1,678, town.) Built in '85-6 by Tuxedo Park Association, to supply its property. SUPPLY.—Tuxedo Lake, pumping to tank. PUMPS.

—Cap., 1,500,000 galls.; two Worthington, 1,000,000 and 500,000. TANK.—Cap., 740,000 galls.; 50 × 50 ft. DISTRIBUTION.—Mains, 10 miles, 12 to 4-in. Taps, 94. Services, galv. i. Meters, 0. Hydrants, 30. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Max., 150 lbs. FINANCIAL.—Withheld. Co. in '91 reported as having reduced its cap. stock from $100,000 to $65,000. NOTE.—No report since Dec. 17, '90.

312. **UNADILLA,** Otsego Co. (1,157.) Built in '86 by S. S. North; in '80 Mr. North built works for fire protection. SUPPLY.—Spring and Martin's Brook, by gravity from impounding reservoir. RESERVOIRS.—Cap., 4,494,000 galls. Old: Cap., 1,746,000; 150 ft. above main street of village. Settling basin, cap., 816,000. Clear water reservoir, cap., 1,932,000. DISTRIBUTION.—Mains, 2 miles. Taps, 100. Meters, 1. Hydrants, 16. PRESSURE.—Ordinary, 87 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Owner, S. S. North; Supt., D. H. Loomis. NOTE.—No report since '89 Manual as regards distribution, and since '90-1 Manual as regards other information. REFERENCE.—Eng. News, Apr. 5, '84.

313. **UNION,** Broome Co. (821.) Built in '91-2 by Union Water Co. SUPPLY.—Springs, by gravity. DISTRIBUTION.—Hydrants, 25. FINANCIAL.—Cost, est., $20,000. Revenue: City, fire protection, $750.

314. **UNIONVILLE,** Orange Co. (316.) Built in '94 by Unionville Water-Works Co. Engr., Jos. B. Rider, So. Norwalk, Conn. Press rept., May, '95, stated village had contracted for fire protection, at $320 per yr. SUPPLY.—Impounding reservoir, supplemented by water pumped from five 2-in. × 22-ft. driven wells, thence by gravity. Reservoir fed by springs. RESERVOIR.—Cap., 10,000,000 galls. FILTER BED.—Area, about 390 sq. ft.; 18 ins. of sand, on rock, with sediment chamber 3 ft. deep below. Either upward or downward filtration. Located just below dam. DISTRIBUTION.—Mains, 3 miles. Hydrants, 22. FINANCIAL.—Cap. Stock, $25,000. Bonded debt, $12,500. MANAGEMENT.—Prest., Chas. W. Wilson, Deckertown, N. J. Rept. by Engr. (and Director), Feb. 25, '97.

315. **UTICA,** Oneida Co. (44,007.) Present works built in '49 by Utica Water-Works Co. From '02 to '49 supplied by various companies; from '24 to '34 the only supply was from private wells. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Surface water, by gravity. RESERVOIRS.—Cap., about 800,000,000 galls.; three impounding and one distributing. DISTRIBUTION.—Mains, 78 miles. Taps, 5,700. Meters, 5,000. Hydrants, 454. FINANCIAL.—Cost, $1,000,000. Cap. Stock, $1,000,000. City pays 6% on all mains ordered by Council, and in addition $10,000 yearly for fire purposes, and one-half of all taxes above $1,000. MANAGEMENT.—Prest., A. G. Brower; Vice-Prest., C. A. Butler; Secy., H. J. Wood; Treas., Chas. B. Rogers. Rept. by Supt., C. W. Pratt, Dec. 26. PROJECTED IMPROVEMENTS.—New reservoir. REFERENCE.—Eng. News, Oct. 22, '81.

316. **VALATIE,** Columbia Co. (1,437.) Built in '94 by village. Engr., Wm. H. Wild. SUPPLY.—Lake, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Worthington non-comp. non-cond. Bituminous coal used; av. cost, $4.50 per short ton. FILTERS.—Cap., 150,000 galls.; New York. STAND-PIPE.—Cap., 150,000 galls.; steel, 16 × 100 ft. DISTRIBUTION.—Mains, 5½ miles. Taps, 75. Services, iron. Hydrants, public, 60; private, 10. PRESSURE.—Ordinary, 65 lbs.; fire, 90 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., R. P. Richmond; Secy., Wilson Miller; Treas., James Purcell. Rept. by Wm. H. Wild, June 13. SEWERS.—None.

F 3. **VERNON,** Oneida Co. (377.) Built in '96 by village for fire protection. Supply, two mill ponds, pumping direct. Three pumps located in mills, with total cap. of about 1,500,000 galls. Hydrants, 14. Cost, $2,000. Prest., Fautteen Martin; Secy., S. D. V. Gardinier. Rept. by I. J. Bartholomew, Sept. 7. Has storm sewers.

317. **WALDEN,** Orange Co. (2,132.) Built in '92 by village. Engr., E. D. Smalley, Syracuse; Contrs., Morrell & Co. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Buffalo, one comp. and one high pressure. Anthracite pea coal used. STAND-PIPE.—Cap., 75,200 galls.; 16 × 50 ft. FISCAL YEAR CLOSED Jan. 1, '95. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income. Meters, 0. Hydrants, 39. CONSUMPTION.—(Galls.) av., 50,000; max., 100,000; min., 40,000. PRESSURE.—Ordinary, 60 lbs. One steam fire engine is used. FINANCIAL.—Cost, $33,000. Expenses: Operating, $1,200. Deficits are met by general taxation. MANAGEMENT.—Prest., Alex. Kent; Secy., Geo. Deyo. Rept. by Ch. Pump. Engr., C. D. Wooly, Nov. 13. SEWERS.—Has sanitary and storm sewers.

318. **WALTON,** Delaware Co. (2,299.) Built in '79 by Walton Water Co. About '92 works were built by Walton Water & Supply Co. These works were bid off at foreclosure sale for (press rept.) $10,000 by Geo. T. Warner, who organized East Brook Water Co. in '95. This Co. has since sold out to the original Co. SUPPLY.—Surface water, by gravity from impounding reservoir on stream. Drainage area, 8 sq. miles. FILTERS.—Cap., 30,000 galls.; charcoal and sponge; 4 × 10 ft., by 18 ft. deep. RESERVOIRS.—Cap., not given; three reservoirs. DISTRIBUTION.—Mains, 15.6 miles. Taps (in '90), 185. Hydrants (in '90), 48. PRESSURE.—(In '89) Ordinary, 85 lbs. FINANCIAL.—Cap. Stock, $50,000. Bonded debt, $50,000. Revenue, $6,845. MANAGEMENT.—Prest., A. H. Sewall; Secy., Paul Nichols; Treas., Geo. T. Warner; Supt., W. A. Shepard. Rept. by Treas., Oct. 6. REFERENCE.—Eng. News, Dec. 9, '82.

319. **WARRENSBURGH,** Warren Co. (893.) Built in '84 by Warrensburgh Water Co. SUPPLY.—Brooks, fed by springs, by gravity to distributing reservoir. DISTRIBUTION.—Mains, 6 miles. Taps, 70. Services, galv. i.; paid for by consumer. Co. cannot compel but may prohibit use of meters. Hydrants, public, 10; private, 5. PRESSURE.—Ordinary, 150 lbs. FINANCIAL.—Cost, $12,000. MANAGEMENT.—Owners, Bates & Cole. Supt., Ira Cole. Rept. by Supt., July 29. SEWERS.—None.

320, 321. **WARSAW,** Wyoming Co. (3,120.)

CITY PLANT.

Built in '95; put in operation Nov. 1. Engrs., Voorhees & Witmer, Buffalo. Contrs., Chandley Bros. & Co., Beaver Falls, Pa. SUPPLY.—Spring Brook, 6 miles from town, by gravity to and from reservoir, through 8-in. and 10-in. pipes, respectively. RESERVOIR.—Cap., 15,000,000 galls.; 320 ft. above and 4 miles from town. DISTRIBUTION.—Mains, 20 miles. Taps, 420; made by consumer for $4. Services, iron; paid for by consumer. Meters, 10; owned, controlled and repaired by the city. Use of meters compulsory for R. Rs. and motors. City cannot compel, but may prohibit use of meters. Hydrants, 132. CONSUMPTION.—(Galls.) av., est., 200,000. PRESSURE.—Ordinary, 130 lbs. FINANCIAL.—Cost, $78,000. Bonded debt, $75,000, at 4%. Expenses, $4,000: Operating, about $900; int., $3,000; taxes, $100. Revenue: Consumers, $4,200; City, none. MANAGEMENT.—Chn., N. S. Beardslee. Rept. by Chn., in Dec., '96. SEWERS.—Has sanitary and storm sewers.

WARSAW WATER-WORKS CO.

Built in '70. FRANCHISE.—Does not provide for purchase of works nor control of rates by city. SUPPLY.—Springs, by gravity from collecting reservoir. RESERVOIRS.—Cap., 4,500,000 galls.; two. DISTRIBUTION.—Mains, 10 miles. Taps, 400. Meters, 10. Hydrants, 60. FINANCIAL.—Cost, $40,000. Cap. Stock, $25,000. Debt, $4,000, at 6%. Revenue: Consumers, $3,700. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, Feb. 4, '82.

322. **WARWICK,** Orange Co. (1,587.) Built in '72 by village. SUPPLY.—Surface water, by gravity from impounding reservoir on small stream. RESERVOIR.—Cap., 8,300,000 galls.; about ½ mile from and 150 ft. above village. DISTRIBUTION.—Mains, 10 miles. Taps, 400. Meters, 10. Hydrants, 60. FINANCIAL.—Cost, $40,000. Cap. Stock, $25,000. Debt, $4,000, at 6%. Revenue: Consumers, unmetered, $3,700; City, $1,000. MANAGEMENT.—Prest., W. H. Bradley; Secy. and Supt., E. H. Morris. REFERENCE.—Eng. News, June 17, '82.

323. **WASHINGTONVILLE,** Orange Co. (691.) Now owned by town. Built in '94 by Washingtonville Water Co.; put in operation Dec., '94. Town bought works Aug. 1, '96. Engr., Wm. B. Petters, Bloomville. Contr., Wm. H. Cowan, Montgomery. SUPPLY.—Jackson Pond, by gravity; pond is fed by springs, within an area of 2,500 acres, on north side of Schunemunk Mts. FILTERS.—At dam. RESERVOIR.—Cap., 3,000,000 galls. storage, 155 ft. above town. DISTRIBUTION.—Mains, 5 to 6 miles. Taps, 50; made by village for $2. Services, lead; paid for by consumer. Meters, 1; owned, controlled and repaired by village. Use of meters optional with village; compulsory for farmers. Hydrants, public, 24. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $27,000. Bonded debt, $27,000, at 4%, due in 1926. No sinking fund. Revenue: Consumers, unmetered, about $700; City, none. MANAGEMENT.—Prest., Chas. Nicoll; Secy., Wm. R. Brooks; Treas., Thos. L. Brook. Rept. by Prest., Dec. 22. SEWERS.—Has storm sewers only.

324. **WASSAIC,** Dutchess Co. (Est., 313.) Built in '93 by Wassaic Water-Works Co., being John R. Thompson, of Amenia, and M. K. Lewis, of Wassaic; put in operation Aug. 1; Engr., John R. Thompson. SUPPLY.—"Springs on mountain, piped to reservoir." RESERVOIR.—Brick, with roof. DISTRIBUTION.—Mains, 2 miles. Taps, 65. Services, galv. i. Meters, 0. Co. can compel use of meters and any consumer may have one. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—No debt. MANAGEMENT.—Supt., John R. Thompson. Rept. by Supt., Nov. 13.

325. **WATERFORD,** Saratoga Co. (Est., 3,523.) Built in '86 by Waterford Water-Works Co. FRANCHISE.—5 yrs. from '96 (contract ?). Rates are fixed in contract. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. SUPPLY.—Hudson River, pumping to stand-pipe. PUMPS.—Cap., 2,250,000 galls.; Worthington comp. cond., 1,000,000 and 1,250,000. Buckwheat coal used; av. cost, $2.90 per short ton. STAND-PIPE.—Cap., 275,000 galls.; steel, 30 × 54 ft. FISCAL YEAR CLOSED Dec. 31. '95. DISTRIBUTION.—Mains, 10 miles; cost extensions met by rentals. Taps, 566; made by Co. at from 50 cts. to $1, according to location. Services, lead and iron; paid for by consumer. Meters, 229; owned by Co. and consumer; controlled by Co.; repaired by owner; yearly rental, $3. Use of meters compulsory for manufacturers and liveries. Co. can compel use of meters and any consumer may have one. Hydrants, public, 68; private, 3. CONSUMPTION.—(Galls.) av., 332,528; max., 1,108,829, at large fire. PRESSURE.—Ordinary, 80 lbs.; fire, 150 lbs. FINANCIAL.—Cap. Stock: Authorized, $72,000; all paid-up. Bonded debt, $72,000, at 6%, due 1906. Expenses, $8,882: Operating, $3,603; int., $4,726; taxes, $453. Revenue, $9,887: Consumers, unmetered, $3,949; metered, $2,606; City, fire protection, $2,775; other purposes, $557. MANAGEMENT.—Prest., J. F. Moffett; Secy., F. B. Roblin; Treas., C. F. Moffett, all of 15 Wall St., N. Y.

City; Supt., Danl. B. McCarthy; Ch. Pump. Engr., Thos. Hallett. Rept. by Supt., June 5. SEWERS.—Has sanitary and storm sewers.

326. **WATERLOO,** Seneca Co. (4,350.) Built in '86 by Waterloo Water Co. SUPPLY.—Seneca River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. cond. STAND-PIPE.—Cap., 172,000 galls.; 50 × 130 ft. DISTRIBUTION.—Mains, 10 miles. Taps, 270. Meters, 3. Hydrants, 60. PRESSURE.—(In '89) Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $150,000. Cap. Stock: Common, authorized, $150,000; all paid-up. Bonded debt, $100,000, at 6%, due 1904-10. Expenses, $8,620: Operating, $2,100; int., $6,000; taxes, $520. Revenue, $10,540: Consumers, $8,500; City, $2,040. NOTE.—No rept. since '90-1 Manual. Press repts. state that Wm. Ross, Rochester, is interested in these works.

327. **WATERTOWN,** Jefferson Co. (14,725.) Built in '53 by city. SUPPLY.—Black River, pumping to reservoir. PUMPS.—Cap., 6,000,000 galls.; two Wood dup. water-power. RESERVOIR.—Cap., 3,250,000 galls.; 150 ft. above river. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, not given; cost extensions met by rentals. Taps, made by consumer. Services, paid for by consumer. City can compel use of meters and any consumer may have one. CONSUMPTION.—(Galls.) av., 3,500,000. Steam fire engines are used. FINANCIAL.—Cost, $383,442. Bonded debt, $235,000: $50,000 at 7%; $45,000 at 5%; $85,000 at 4%; $15,000 at 3½%; $40,000 at 3%. Sinking Fund, invested at 3% to 7%. Expenses: Operating, $6,005; int., $9,500. No deficits. MANAGEMENT.—Prest., J. C. Knowlton; Treas., N. P. Wardwell; Supt., A. Salisbury. SEWERS.—Has sewers. REFERENCE.—Eng. News, Apr. 22, '82.

328. **WATERVILLE,** Oneida Co. (2,024.) Built in '88 by village. SUPPLY.—Surface water by gravity from storage and distributing reservoirs. FILTERS.—Gravel bank; divides one of distributing reservoirs in two parts. RESERVOIRS.—Cap., 20,000,000 galls. Storage: 18,000,000. Area, 6 acres, 26 ft. of water; 177 ft. above R. R. in village. Distributing: 2—1,000,000. DISTRIBUTION.—Mains, 8 miles; cost extensions met by corporation. Taps, made by city for $1. Services, iron; paid for by city and consumer jointly. Meters, 20; owned, controlled and repaired by city and consumer jointly; yearly rental, 10%. Use of meters optional with city; compulsory for public places and power. Hydrants, public, 51; private, 1. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 95 lbs. FINANCIAL.—Debt, $58,000 at 4%. Expenses: Operating, $200; int., $2,200. Revenue: Consumers (in '90), $2,100; City, none. MANAGEMENT.—Secy., W. L. Race. Rept. by Prest., F. H. Coggeshall, Aug. 20. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Dam for distributing reservoir, June 21, '90; filtration, Aug. 30, '94. NOTE.—A private system of considerable extent, for sole use of Tower Estate, could be connected with system if necessary.

329. **WATERVLIET,** Albany Co. (12,967; former village of West Troy.) Built in '73-6 by West Troy Water-Works Co. to supply former village of West Troy, which latter was incorporated in '96, with some outlying territory, as city of Watervliet. SUPPLY.—Originally Mohawk River, by pumping. For '89-90 Manual rept. that supply was from Green Island works. In '95, Alex. Potter, 137 Broadway, N. Y. City, designed plans for rehabilitating old Mohawk River plant, which, he states, were carried out in '96, with O. H. Burlingame, Engr. Plans included two new dams, 10 ft. high, with total length of 750 ft.; a stand-pipe 30 ft. high and 7,000 ft. of 6-in. mains. Original Mohawk supply was pumped to chamber ½ mile from, 130 ft. above river, from which it flowed by gravity 5 miles to 70,000,000-gall. reservoir, covering 13 acres, ½ mile from village. Dam, 1,300 ft. long, across river, gave 7 ft. to drive 1,500,000-gall. Vergennes pumps. DISTRIBUTION.—Mains, 11 miles. Taps, 584. Meters, 0. Hydrants, 87. FINANCIAL.—Cost, $300,000. Cap. Stock, $100,000. Bonded debt, $200,000 at 6 and 7%. Revenue: Consumers, $12,000; City, $10,000. MANAGEMENT.—According to press rept., W. F. Ross, Rochester, is now an official. NOTE.—No official report since '89-90 Manual. Act incorp. city provided for a water commission to have charge of providing city with water; to investigate plan for works, rept. same to council and build or buy works, in case people vote for same; commission has powers of condemnation, and provides that until city owns works commission may make yearly contracts for water for public service, at not over $10,000 a yr. Commission was appointed in Aug., '96: Geo. H. Kimberly, M. H. Crawford and 5 others. Press rept., Feb. 6, '97, stated surveys and plans for municipal works would be made. REFERENCE.—Eng. News, Mar. 18, '82.

330. **WATKINS,** Schuyler Co. (3,000, est.) Built in '90-1 by village. SUPPLY.—Seneca Lake, pumping to reservoirs. PUMPS.—Cap., 750,000 galls.; Worthington simple high pressure, 250,000 and 500,000. Bituminous coal used; av. cost, $2.35 per short ton. RESERVOIRS.—Cap., 700,000 galls.; storage and distributing, 600,000 and 100,000. DISTRIBUTION.—Mains, not given; cost extensions met by water rates. Taps, 229; made by village, including service to curb line. Services, galv. i.; paid for by consumer. Meters, 90; owned, controlled and repaired by village; yearly rental, 10% of cost. Village can compel use of meters and any consumer may have one. Hydrants, public, 61; private, 1. CONSUMPTION.—(Galls.) av., 225,000; max., 250,000; min., 200,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $65,000. Bonded debt, $65,000 at 4%; due 20 yrs. from '90. Sinking Fund: $3,000, deposited with Knickerbocker Trust Co.; $1,000 raised each year. Expenses: Operating, $2,800. Revenue: Consumers, unmetered, $1,800; metered, $1,000. Interest is met by taxation. MANAGEMENT.—Prest., W. H.

Wait; Secy., C. M. Woodward; Supt., C. E. Dennis. Rept. by Secy., June 10. SEWERS.—Has sanitary and storm sewers.

331. **WAVERLY,** Tioga Co. (4,123.) Built in '80 by Waverly Water Co. FRANCHISE.—Unlimited; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental. SUPPLY.—Surface water and springs, by gravity. RESERVOIRS.—Cap., 130,000,000 galls.; impounding. No. 1, 100,000,000; area, 17 acres; 100 ft. above village; No. 2, 30,000,000. DISTRIBUTION.—Mains, 10 miles. Taps, 550; made by Co. at consumer's expense. Services, galv. i.; paid for by consumer. Meters, 50; owned by Co. and consumer; controlled by Co.; repairs paid by consumer; yearly rental, $2. Co. can compel use of meters and any consumer may have one. Hydrants, 42. CONSUMPTION.—(Galls.) av., 750,000. PRESSURE.—Ordinary and fire, 87 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. T. Sawyer. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 18, '82.

215. **WAVERLY** (P. O. Tuckahoe.), Westchester Co. (Not given.) In East Chester town, supplied by New Rochelle Water Co., New Rochelle.

332. **WEEDSPORT,** Cayuga Co. (1,580.) Built in '96 by Weedsport Water Co. City to pay $30 per hydrant per yr. for 15 yrs. SUPPLY.—Springs, 4 miles from village, by gravity, to impounding and distributing reservoir. Services, paid for by Co. to curb. Hydrants, 20. FINANCIAL.—Cap. Stock, authorized, $50,000. Revenue: City, fire protection, $600. MANAGEMENT.—Prest., F. P. Taber; Secy. and Treas., F. C. Reynolds. Information from unsigned postal card and press repts.

333. **WELLSBURG,** Chemung Co. (Est., 874.) Built in '92 by village; put in operation in July. Engr., C. T. Rogers. Contrs., Inman Bros. Constn. Co., N. Y. City. SUPPLY.—Four 4-in. driven wells, 30 ft. deep, pumping to reservoir. PUMP.—Cap., 360,000 galls.; Snow; power furnished by manufg. co. RESERVOIR.—Cap., 250,000 galls.; 211 ft. above main street. DISTRIBUTION.—Mains, 2 miles. Taps, 18; made by village at 20 cts. per hour. Services, galv. i.; paid for by owner. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 20. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $9,700. Bonded debt, $10,500 at 5%; $500 due yearly, beginning in '97. Expenses, $825: Operating, $300; int., $525. Revenue: Village, none. MANAGEMENT.—Prest., M. W. Baldwin; Secy., Albert Roberts; Treas., Frank Benedict; Ch. Pump. Engr., Wm. Haines. Rept. obtained by J. M. Diven, Elmira, Nov., '96. SEWERS.—None.

334. **WELLSVILLE,** Allegany Co. (3,435.) Built in '83 by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—25 yrs.; provided for purchase of works by city in '93, price to be determined by arbitration. Maximum rates are fixed in franchise and subject to regulation by city. SUPPLY.—Impounding reservoir on stream, by gravity, and driven wells and Genessee River, by pumping. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington. RESERVOIRS.—Cap., 5,000,000 galls; area 1½ acres. DISTRIBUTION.—Mains, 8 miles. Hydrants, 54. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jas. Macken; Secy. and Treas., W. S. Kuhn, Pittsburg; Supt., W. K. Dunbar. Rept. by Am. W.-W. & G. Co., Aug. 20. REFERENCE.—Eng. News, Oct. 3, '85.

335. **WEST CARTHAGE** (P. O. Carthage), Jefferson Co. (932.) Built in '95 by village. Engr. and Contr., A. F. Nims, Philadelphia, N. Y. SUPPLY.—From Carthage works; rental, $500 per year. MANAGEMENT.—(In '95) Comrs.: Prest., Geo. D. Hewitt; Secy., I. M. Gibbs; Treas., M. P. Mason. NOTE.—No further information could be secured, except that village owns a fairly extensive distributing plant for general supply.

336. **WESTFIELD,** Chautauqua Co. (1,983.) Built by village; put in operation in '90. SUPPLY.—Chatauqua Creek, filtered, by gravity to reservoir; filtered again, thence by gravity. FILTERS.—Gravel. Supply main, about 16,000 ft., 12-in. pipe. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 17.4 miles; cost extensions met by bonds and income. Taps, made by consumer. Services, galv. i.; paid for by consumer. Village can compel use of meters and any consumer may have one. Hydrants, 101. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 78 to 100 lbs. FINANCIAL.—Bonded debt, $83,000: $63,000, at 3½%; $20,000, at 4%; all due at various dates after '99. Expenses, $6,687: Int., $2,965. Revenue, $7,445: Consumers, $4,762; City, none. MANAGEMENT.—Prest., Geo. W. Patterson; Secy., F. W. Crandall; Treas., R. G. Wright. Rept. by Prest., June 5. SEWERS.—None.

——?. **WESTPORT,** Essex Co. (563.) Built in '92 by Westport Mountain Spring Co.; put in operation in Oct. No further information can be obtained.

28. **WEST ISLIP,** Suffolk Co. See Bay Shore.

329. **WEST TROY,** Albany Co. See Watervliet.

337. **WHITEHALL,** Washington Co. (4,484.) Built in '52; rebuilt in '84; by village. SUPPLY.—East Creek, pumping to reservoir. PUMP.—Cap., 1,500,000 galls.; Davidson, comp. cond., single acting. Anthracite pea coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., 4,500,000 galls.; 260 ft. above and about 1½ miles from village. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 447; made by consumer, free. Services, galv. i.; paid for by consumer. Meters: 64;

owned, controlled and repaired by consumer. Village can compel use of meters and any consumer may have one. Hydrants, public, 53. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 114 lbs. FINANCIAL.—Cost, $84,000. Bonded debt, $77,000: $25,000, at 4%; due 1904; $29,000, at 4%; due 1914; $23,000, at 3½%; due $1,000 each yr. Expenses, $8,804: Operating, $5,264; int., $3,040. Revenue, $7,606: Consumers, unmetered, 5,606; metered, $2,000. Interest met by taxation. MANAGEMENT.—Prest., Geo. Bennett; Secy. and Supt., M. M. Manville; Treas., E. C. Pratt; Ch. Pump. Engr., Jos. Robitaille. Rept. Oct. 3, '96. REFERENCE.—Eng. News, Oct. 10, '85.

338. **WHITE PLAINS,** Westchester Co. (4,042.) Built in '85 by Westchester County Water-Works Co. FRANCHISE and LEGAL DIFFICULTIES.—See note. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; Worthington comp. non-cond.; 500,000 and 1,250,000. STAND-PIPE.—Cap., 275,000 galls.; 30 × 52 ft. DISTRIBUTION.—Mains, 17 miles. Taps, 950. Meters: 578. Hydrants, public, 124. FINANCIAL.—Bonded debt, $200,000, at 6%. Expenses: Int., $12,000. Revenue: Consumers, $20,840; City, fire protection, $3,990; sewer flushing, $500. MANAGEMENT.—Prest., J. V. Clarke; Supt., Fredk. Seymour. SEWERS.—Has sewers. NOTE.—Franchise provides that city may buy works at 10% in advance of cost of construction. There has been much contention over price, but court has finally appointed appraisers, having determined that city has taken proper proceedings and is entitled to works. (Press repts.)

D 24, P 13. **WHITESBORO,** Oneida Co. (1,663.) Built in '27 by Lyman L. Wight. Supply, springs, by gravity from 5,000-gall. reservoir. Taps, 60; made by owner for $7.50. Services, iron; paid for by owner. Meters, 0. Pressure, 15 to 60 lbs. Expenses: Operating, $40. Rept. by owner, July 13. Reference, Eng. News, Mar. 1, '84.

PROJECTED WORKS.

Village talked of building in '95. Sept., '96, press rept. stated that Dr. C. E. Smith, Edw. C. Wagner and others had incorp. Co., with cap. stock of $10,000, and would buy above plant and extend works to furnish fire protection.

339. **WHITESTONE,** Queens Co. (2,808.) Built in '92 by village. Engr., J. A. Rouillier, Flushing. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Worthington comp. cond. FINANCIAL.—Cost, est., $50,000. MANAGEMENT.—Treas., Moses Worms.

340. **WHITESVILLE,** Allegany Co. (573, est.) Built in '88 by Whitesville Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Large springs, 204 ft. above main street, by gravity. RESERVOIRS.—Cap., 40,950 galls.; distributing. DISTRIBUTION.—Mains, 1.3 miles. Taps, 35. Services, galv. 1. Hydrants, 10. FINANCIAL.—Cost, $3,500. No debt. Revenue, $275: Consumers, $175; City, $100. MANAGEMENT.—Agt., A. L. Chase. Rept. by Agt., June 5. NOTE.—No report as to distribution and financial since '90-1 Manual.

341. **WILLIAMSVILLE,** Erie Co. (Est., 1,366.) Built by village; put in operation May 1, '96. Engrs., Voorhees & Witmer, Buffalo. Contr., W. B. Wilson, Buffalo. SUPPLY.—Springs, 360,000 galls. daily, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Snow. Power from boilers of electric railroad. RESERVOIRS.—Cap., 18,000 galls.; located 1,000 ft. from pumps. STAND-PIPE.—Cap., 70,500 galls.; iron, 12 × 100 ft. DISTRIBUTION.—Mains, 3 miles. Taps, 30; made by village for $1. Services, iron; paid for by owner. Hydrants, 35. CONSUMPTION.—(Galls.) av., 6,000. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $23,000. Bonded debt, $24,000, at 4%; due in 30 years. MANAGEMENT.—Prest., James Chalmers; Secy., John Grove; Treas., D. Wehrle; Supt., Chas. Summers. Rept. by Prest., June 29. SEWERS.—None.

342. **WINDHAM,** Greene Co. (1,503, town.) Built in '95 by Windham Village Water Co.; put in operation Nov. 1. Contr., J. Vaughn. SUPPLY.—Spring, by gravity. RESERVOIR.—Cap., 125,000 galls.; distributing; covered masonry. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 1½ miles. Taps, 40; made by Co., free. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 4,000; max., 10,000; min., 2,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock: Authorized, $10,000; all paid-up; paid 4% div'd in '95. No debt. Expenses: Operating, $50; taxes, none. Revenue, $680: Consumers, unmetered, $475; City, fire protection, $205; other purposes, none. MANAGEMENT.—Prest., Chas. L. Andrus, Stamford; Secy., Frank M. Andrus, Roxbury; Treas., J. C. Tallmadge, Catskill; Supt., Wm. H. Moon. Rept. by Treas., Nov. 16. SEWERS.—None.

343. **WORCESTER,** Otsego Co. (2,741, town.) Built in '87 by Worcester Water Co., under 99 yrs. franchise or charter. SUPPLY.—Caryl Lake, by gravity. Area of lake, 41 acres. FISCAL YEAR CLOSED May 6. DISTRIBUTION.—Mains, 6 miles. Taps, 87. Services, lead. Meters, 0. Hydrants, 17. PRESSURE.—Ordinary, 70 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock, $24,000. Debt, $15,500: Floating, $500, at 6%; Bonded, $15,000, at 6%. Expenses, $1,200: Operating, $300; int., $900. Revenue, $1,200: Consumers, $600; City, $600. NOTE.—No rept. since '90-1 Manual.

344. **YONKERS,** Westchester Co. (32,033.) Built in '76 by city. A few houses are supplied from mains owned by New York City District Water Supply Co., which takes water from Pocantico drainage area, near Tarrytown, and supplies it in the district in the vicinity of its drainage area and also southeast of Yonkers. In Jan., '93, Co. received permission to lay a 12-in. main in a direct course through the city. Co. cannot supply water to consumers in city, but city may use water from main same as if main was owned by it, paying a fixed price per 1,000 galls. Co. has laid about 6 miles of pipe and city has laid about 1½ miles connecting with it, on which there are 45 taps (not included below). From summer of '94 to Dec. 1, '95, city had taken about 1,700,000 galls. from these mains. Owing to deficient pressure this supply is not used as much as was expected. SUPPLY.—Sprain and Grassy Sprain Brooks, pumping from impounding to distributing reservoirs and direct. Drainage area, 3,210 acres. In emergency water is bought from New Rochelle Water Co. and from New York City, latter being pumped from aqueduct. In '95 about 66,000,000 galls. was so bought at cost of about $6,000. PUMPS.—Cap., 9,500,000 galls. Low service: Wright, 2,500,000, and Worthington, 4,000,000. High service: Worthington, 1,000,000 and 2,000,000. Anthracite coal used; av. cost, $3.90 per short ton, delivered. RESERVOIRS.—Cap., 464,500,000 galls. Storage: 400,000,000, in Grassy Sprain valley; area, 101 acres; av. depth, 12½ ft.; 113 ft. above tide. Distributing: Fort Field Reservoir, 60,000,000; on Pelham Road; Lake Avenue, 4,500,000. TANKS.—Cap., 315,000 galls. One, 40,000, iron, 18 × 20 ft.; one, 275,000, steel, 20 × 122 ft. Both inclosed in brick towers. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 56.7 miles; cost extensions met by bonds. Taps, 3,714; made by city at $2.50 for ¾-in., $3 for 1-in., $3.50 for 1½-in., $4 for 2-in. and $5 for 3-in. Services, lead; paid for by owner. Meters, 3,706; owned by consumer; controlled by city; repairs paid by city except in case of freezing. Use of meters compulsory for all consumers. Hydrants, public, 582; private, 15. CONSUMPTION.—(Galls.) av., 3,230,000. PRESSURE.—Ordinary, 50 to 130 lbs. FINANCIAL.—Cost, $1,413,390. Bonded debt, $1,300,000, at av. int. of 5.46%: $625,000, at 7%, due 1903 to 1920; $30,000, at 5%; $625,000, at 4%; $20,000, at 3½%. Sinking fund: $168,070, invested in 4% city bonds. Expenses: Operating, $34,763; water bought, $6,968; int., $71,083. Paid to sinking fund, $14,900. Revenue, $124,181: Consumers, unmetered, $500; metered, $107,166; City, fire protection, $16,290; street sprinkling, $225. All expenses are paid by income, including sinking fund and interest. MANAGEMENT.—Prest., Wm. H. Doty; Secy. and Supt., Jos. A. Lockwood; Treas., Jacob Read; Ch. Pump. Engr., Geo. A. Mitchell. Rept. by Supt., July 7. PROJECTED IMPROVEMENTS.—Increasing storage cap. of Grassy Sprain Valley reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 27, '81; brick tower and tank, Oct. 18, '84; masonry tower, May 19, '92.

NEW JERSEY.*

42. **ARLINGTON,** Hudson Co. In Kearney township. See Kearney.

1. **ASBURY PARK,** Monmouth Co. (Est., 8,500.) Built in '86 by village. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; 750,000 and 2—500,000 Holly hor. dup. Also air-lift pump for wells, with 14 × 22-in. dup. Rand air compressor. Coal used; av. cost, $2.83 per short ton. FILTERS.—Cap., 2,000,000 galls.; Continental. STAND-PIPE.—Cap., 106,000 galls.; 12 × 125 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 13 miles; cost extensions met by bonds. Taps, 1,028; made by water-works for $3. Services, lead and galv. i.; paid for by property owner. Meters, 100; owned, controlled and repaired by city; yearly rental, 10% of cost. Use of meters is compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, 64. CONSUMPTION.—(Galls.) av., 500,000; max., 1,100,000; min., 300,000. PRESSURE.—Ordinary, 45 lbs.; fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $158,000. Bonded debt, $142,000, at 5 and 4%. Expenses, $10,000. Revenue: Consumers (in '90), $10,867. MANAGEMENT.—Prest., G. W. Treat; Secy. and Supt., G. H. Coffin. Ch. Pump. Engr., E. W. Howland. Rept. by Secy., June 10, '96. PROJECTED IMPROVEMENTS.—Dec., '96, Isaac S. Cassin & Son, Philadelphia, rept. they had been engaged as Engrs. for improvements. Bids were to be opened Feb. 8, '97, for the erection of a brick building at the main pumping station, and for the construction of a receiving basin of brick and cement, 50 ft. sq. and 11 ft. deep; also Feb. 15, for 1,500,000-gall. pumping engine. SEWERS.—Has sanitary sewers only. REFERENCES.—Removal of iron in water, Jan. 25, '94; filtration, June 4, '96, illus.

2. **ATLANTIC CITY,** Atlantic Co. (13,055.) Now owned by city. First supplied in '83 by Atlantic City Water-Works Co. In '88-9 Consumers' Water Co. built competing works. In '92 city made bargains to buy plants at $500,000 and $200,000 respectively,

*For detailed information regarding the character, extent and yield of the drainage areas of the State and their use for water supply and power, see "Report on Water Supply, Water Power, the Flow of Streams and Attendant Phenomena," by C. C. Vermeule, being Vol. III. of the Final Report of the State Geologist of New Jersey.

but later the Cos. took advantage, it is alleged, of a technical point, refused to deliver the works, and consolidated in Apr., '93, as Atlantic Water Co. In '94 appraisers fixed price of works at $843,564. Co. applied to court for confirmation of award, but city asked leave to discontinue proceedings. Later Co. and city split the difference between original purchase price and appraised valuation, and in Apr., '95, award was confirmed at $771,782. City took possession Aug. 1, '95. (Complications regarding the purchase from press repts.) LEGAL DIFFICULTIES.—The Atlantic City Water Co. and city had legal difficulties during existence of Co. (press rept.). SUPPLY.—Wells and stream on mainland, and artesian wells on island, pumping to stand-pipes. PUMPS.—Cap., 13,000,000 galls.; Worthington hor. comp. high duty, 5,000,000; Gordon comp. cond., 3,000,000; Worthington comp. cond., 1,000,000; Worthington simple non-cond., 1,000,000; Smith-Vaile, two comp. non-cond., 1,500,000 each. Bituminous and anthracite coal used; av. cost, $2.50 and $2.86 per short ton, respectively. Force mains from mainland, 12-in. and 20-in. c. i., laid 6 miles across meadows. STAND-PIPES.—Cap., 670,000 galls. Two; steel. One, 485,000; 25 × 132. One 185,000; 15 × 140 ft. FISCAL YEAR CLOSED Aug. 1, '96. DISTRIBUTION.—Mains, 51½ miles; cost extensions met by bonds. Taps, 3,400; made by city including service to curb for $8 and up. Services, galv. i.; paid for by owner. Meters, 1,830; 1,480 owned by city, balance by consumers; controlled and repaired by city. Use of meters compulsory for large users and any suspected of wasting; city can compel use of meter and any consumer may have one. Hydrants, public, 451; private, 2. CONSUMPTION.—(Galls.) av., 4,500,000; max., 9,000,000, min., 3,000,000. Consumption varies very greatly with the season, owing to the city being a summer resort. PRESSURE.—Ordinary, 35 to 45 lbs. Steam fire engines are used. FINANCIAL.—Cost, $771,782, paid by city for works; $100,000 is being spent for pipes and meters. No floating debt. Bonded debt, $775,000, at 5%, due 1925; $100,000, at 4½%, due 1926; Sinking Fund: $20,000, not yet invested. Expenses: Operating, $34,206. Revenue: Consumers, $68,975; City, fire protection, $3,966. Deficits would be met by taxation. MANAGEMENT.—Comrs. Chn., D. S. White, Jr.; Secy., Franklin P. Cook; Cashier, Wm. H. Randolph; Supt., W. C. Hawley; Ch. Pump. Engrs., D. Robinson and J. W. Smith. Rept. by Supt., June 22, '96. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, Apr. 21, '83; stand-pipe, Sept. 7, '93, illus.

3. **ATLANTIC HIGHLANDS**, Monmouth Co. (Official census, 945; est., 2,000 in winter, 15,000 in summer.) Built in '93 by town. Engr., C. P. Basset; Contrs., Heiport & Ayres. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMP.—Cap., 830,000 galls.; Barr. Anthracite pea coal used; av. cost, $3 per short ton. FILTERS.—Cap., 300,000 galls.; Continental. STAND-PIPE.—Cap., 250,000 galls.; 30 × 50 ft. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 8.95 miles; cost extensions met by taxation. Taps, 305; made by town for $3. Services, iron; paid for by consumer. Meters, 29; owned by consumer; controlled and repaired by town at owner's expense; yearly rental, $2 to $10. Use of meters optional with town; compulsory for hotels, tenements and stables. Hydrants, 74. CONSUMPTION.—(Galls.) av., 109,428; max., 264,000 (August); min., 37,400 (March). PRESSURE.—Ordinary, 120 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $60,000. Operating, $3,452; int., $3,600. Revenue: Consumers, unmetered, $4,089; metered, $1,241; other purposes, $106 (taps). Deficits are met by general tax; deficit, $1,668. MANAGEMENT.—Treas., N. H. Roberts; Supt., Fred Roberts; Ch. Pump. Engr., G. C. Lewis. Rept. by Supt., Aug. 13. SEWERS.—Has sanitary sewers only. REFERENCES.—Mechanical filters, June 4, '96, illus.; stand-pipe accident, Nov. 12, '96.

4. **BAYONNE CITY**, Hudson Co. (19,033.) Built in '82 by city. SUPPLY.—Bought from Jersey City. (See Projected Improvements, below.) FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, not given; cost extensions met by income. Taps, 2,500; made by city. Services, lead; paid for by consumer. Meters: 3,000 (?); owned by consumer; controlled and repaired by city. Use of meters compulsory for all services. Hydrants, 400; private, 200. CONSUMPTION.—(Galls.) av., 1,300,000; min., 1,280,000. PRESSURE.—Ordinary, 25 lbs. Steam fire engines are used. FINANCIAL.—Cost, $190,000. Bonded debt, $136,000, at 5%: Expenses, $62,139. Revenue: Consumers, $66,053. No deficits. MANAGEMENT.—Rept., except Financial and Projected Improvements, from Water Purveyor, Chas. McBride, July 10, '96. SEWERS.—Has sanitary and storm sewers. NOTE.—No report as to financial since '90-1 Manual. PROJECTED IMPROVEMENTS.—In Sept., '94, city contracted with Washington & Beall for an artesian well supply from Staten Island, water to be sold the city at $89 per 1,000,000 galls. for the first 2,000,000; from 3,000,000 to 6,000,000, $80; all above last amount, $40. Contract for 25 yrs., with provision that city may buy works after 10 yrs. Apr. 19, '95, New York & New Jersey Water Co. was organized by Chas. E. Clarke, Montclair; Jno. W. Coburn, N. Y. City, and others, and contract was afterwards assigned to it (press rept.). New Co. contracted with East Jersey Water Co. (see Newark) for supply, and in '96 laid about 8 miles of 30-in. riveted steel main from point near Jersey City reservoir at Belleville across meadows to Bayonne.

5. **BEACH HAVEN**, Ocean Co. (Est., 390.) Built in '93 by borough; put in operation Aug. 16. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. No legal difficulties. SUPPLY.—Artesian well, 6 ins. in diam., furnishing 190,000 galls. daily, pumping to reservoir and tank. PUMPS.—Cap., 380,000 galls.; 2—190,000 dup. Barr. Anthracite pea coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 25,000 galls.;

near pumps. TANK.—Cap., 75,000 galls.; Cedar; 25 × 22 ft., on heart pine trestle, 30 ft. sq. and 100 ft. high. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 5 miles; cost extensions met by appropriations of council. Taps, 200; made by borough for $2. Services, galv. 1.; paid for by property owner. Meters, 0. Hydrants, public, 24; private, 1. CONSUMPTION.—(Galls.) av., 50,000; max., 65,000; min., 10,000. PRESSURE.—Ordinary, 48 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $20,000. Expenses: Operating, $500. MANAGEMENT.—Mayor, Wm. L. Butler; Secy., Wm. F. Beer; Treas., S. R. Cowperthwaite; Supt. and Ch. Pump Engr., F. H. Potts. PROJECTED IMPROVEMENTS.—Enlargement of reservoir. SEWERS.—Has sanitary and storm sewers.

6. **BELLEVILLE,** Essex Co. (3,487.) Distribution system built in '71 by village. SUPPLY.—Newark works, through meter. DISTRIBUTION.—Mains, 7½ miles. Hydrants, 63.

7. **BELVIDERE,** Warren Co. (1,768.) Built in '77-8 by Belvidere Water Co. SUPPLY.—Delaware River, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Blake dup. STAND-PIPE.—Cap., 33,920 galls.; 6 × 160 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 175. Meters, 3. Hydrants, 25. FINANCIAL.—Cost, $23,500. Cap. Stock: Authorized, $23,000; all paid-up; paid 5% div'd in '90. No debt. Revenue, $2,600: Consumers, $2,000; City, $600. MANAGEMENT.—(July, '96) Prest., D. C. Blair; Secy. and Genl. Mgr., D. G. Heffner. SEWERS.—Has sewers. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, July 22, '82.

39. **BERGEN FIELD,** Bergen Co. (Not given.) Supply from Hoboken.

39. **BERGEN TOWNSHIP,** Bergen Co. (Not given.) Supply from Hoboken.

8. **BEVERLY,** Burlington Co. (1,957.) Built in '86-7 by Beverly Water Co. SUPPLY.—Delaware River, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Gordon. STAND-PIPE.—Cap., not given; 120 ft. high. DISTRIBUTION.—Mains, 6½ miles. Taps, 310. Meters, 0. Hydrants, 44. FINANCIAL.—Cap. Stock, $50,000. NOTE.—No report since '90-1 Manual.

9. **BLAIRSTOWN,** Warren Co. (1,662.) Built in '89 by J. T. Blair. SUPPLY.—Springs, pumping to stand-pipe. PUMP.—Cap., 575,000 galls.; water power. STAND-PIPE.—Cap., 112,000 galls.; 15 × 85 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 40; made by consumer for $7. Meters, 0. Hydrants, 12. PRESSURE.—Ordinary, 65 lbs.; fire, 75 lbs. FINANCIAL.—No floating debt or sinking fund. Expenses, $600. MANAGEMENT.—Treas., W. H. Vail; Supt. and Ch. Pump. Engr., G. H. Dorland. SEWERS.—None.

23. **BLOOMFIELD,** Essex Co. See East Orange.

10. **BOONTON,** Morris Co. (3,307, town.) Built in '95 by Boonton Water Co.; put in operation in Aug. Engr., Lewis Van Duyne; Contr., C. P. Bassett, Summit. FRANCHISE.—25 yrs. from '95; provides for purchase of works by city every 10 yrs. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $25 per hydrant per annum. No legal difficulties. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 500,000,000 galls. Storage and distributing. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 8 miles. Taps made by Co. for $16, including service to curb. Services, galv. 1.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 56; private, 2. PRESSURE.—Ordinary, 20 to 105 lbs. FINANCIAL.—Cost, $132,000. Cap. Stock: Authorized, $150,000; paid-up, $100,000. Floating debt, $8,000, at 6%. Bonded, $70,000, at 6%, due 1915. Expenses, $5,280: Operating, $600; int., $4,680. Revenue, $3,375: Consumers, unmetered, $2,000; City, fire protection, $1,375. MANAGEMENT.—Prest., Lewis Van Duyne; Secy. and Supt., Thos. J. Hillery; Treas., Jno. C. Connor, Orange. SEWERS.—None.

11. **BORDENTOWN,** Burlington Co. (4,282.) Built in '56 by Bordentown Reservoir & Water Co. FRANCHISE.—Perpetual. Co. is not exempt from local taxes. City to pay $600 per year for fire protection. No legal difficulties. SUPPLY.—Delaware River, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 500,000 Worthington comp. cond. and 1,000,000 Deane comp. dup. Bituminous coal used; av. cost, $3.50 per short ton. FILTERS.—Cap., 1,000,000 galls.; National (or New York). RESERVOIRS.—Cap., 500,000 galls.; 2—250,000; storage. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Meters, 8; owned by Co. Co. can compel use of meters and any consumer may have one. Hydrants, 60. CONSUMPTION.—(Galls.) av., 500,000. FINANCIAL.—Cap. Stock: Authorized, $50,000; paid-up, $29,150; paid 3½% div'd in '95. Bonded debt, $12,000 MANAGEMENT.—Prest., J. H. Longstreet; Secy. and Treas., J. Bingham Woodward; Supt., J. M. Steele. Rept. by Secy. REFERENCE.—Eng. News, Apr. 22, '82.

12. **BOUND BROOK,** Somerset Co. (1,462.) Built in '88 by Bound Brook Water Co. FRANCHISE.—50 yrs. from '87. City to pay $20 per hydrant per yr.; contract runs from year to year. No legal difficulties. SUPPLY.—East branch of Middle Brook, by gravity. Drainage area, about 10 sq. miles. RESERVOIRS.—Cap., 12,000,000 galls.; impounding, 11,000,000; distributing, 1,000,000. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by issuing new stock and from earnings. Taps, 485; made by Co. for $10. Services, galv. 1.; paid for by consumer. Meters, 0. Hydrants, public, 50; private, 2. CONSUMPTION.—(Galls.) av., 250,000; max., 300,000; min., 200,000. PRESSURE.—Ordinary, 43 lbs.; fire, 52 lbs. FINANCIAL.—Cost,

$50,000. Cap. Stock: Authorized, $62,000; all paid-up; paid 5% div'd in '96. Expenses, $2,100: Operating, $1,600; taxes, $500. Revenue, $5,500: Consumers, $4,000; City, fire protection, $850; street sprinkling, $150; sewer flushing, $150; other purposes, $350. MANAGEMENT.—Prest., O. B. Reynolds; Secy. and Treas., W. B. R. Mason; Mgr., Silvanus Ayres, Jr. Rept. by Supt., Sept. 30. SEWERS.—Has sanitary sewers only. REFERENCE.—Dam on Middle Brook, Eng. News, June 21, '90.

13. **BRESLIN PARK** (P. O., Mt. Arlington), Morris Co. (Est., in summer, 1,000; winter, 50.) Built about '90 by Breslin Park Assoc. to supply Hotel Breslin and a number of surrounding cottages and for fire protection. Breslin Park is situated in the borough of Mt. Arlington. SUPPLY.—Lake Hopatcong, pumping to tank. TANK.—Cap., 25,000 galls.; 15 × 20 ft., wood, on wooden tower 50 ft. high. DISTRIBUTION.—Mains, 1 mile. Taps, 10 to 15. Services, iron. Meters, 0. Hydrants, public, 6 (?). PRESSURE.—Ordinary, about 30 lbs.; fire, direct pressure. MANAGEMENT.—Mayor of Mt. Arlington borough, Howard P. Frothingham; Clerk, John L. Taylor, M. D. SEWERS.—Has sanitary sewers only.

14. **BRIDGETON,** Cumberland Co. (11,424.) Built in '77-8 by city. SUPPLY.—Springs, well and collecting gallery, pumping to reservoir. Well (in '89) was 28 × 30 ft. Collecting gallery (press rept.) is 20 × 500 ft., 12 ft. deep, covered with 2-in. plank, above which is 6 ins. of sand; ventilated. PUMPS.—Cap., 3,500,000 galls.; 1,500,000 Worthington comp. cond and 2,000,000 Barr. Cumberland coal used; av. cost, $2.89 per short ton. RESERVOIR.—Cap., 1,500,000 galls.; distributing, 103 ft. above and one mile from village. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 23½ miles; cost extensions met by revenue. Taps, 1,790; made by city. Services, galv. i.; paid for by consumer. Meters, 10; owned, controlled and repaird by city; yearly rental, none. Hydrants, public, 180; private, 20. CONSUMPTION.—(Galls.) av., 630,000; max., 1,500,000; min., 500,000. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $145,000. Bonded debt, $53,000, at 6%. Expenses, $8,740: Operating, $5,340; int., $3,400. Revenue, $22,000. MANAGEMENT.—Chn., D. S. Blew; City Treas., Saml. H. Hitchner; Supt., T. Woodruff; Ch. Pump. Engr., Chas. W. Baker. Rept. by Supt., June 8. SEWERS.—None. REFERENCE.—Eng. News, Jan. 7, '82.

15. **BURLINGTON,** Burlington Co. (7,264.) Now owned by city; built in '04 by an aqueduct co.; in '48 Thos. Dugdale laid pipe and in '48 bought aqueduct co.'s works; in '60 works passed into hands of Burlington Water-Works Co., and in '77 were bought by city. SUPPLY.—Delaware River, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 1,500,000 Holly-Gaskill hor. high duty and 500,000 Worthington comp. cond. Anthracite pea coal used; av. cost, $2.35 per short ton. STAND-PIPE.—Cap., 282,000 galls.; 20 × 120 ft., on stone. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 11½ miles; cost extensions met by consumers. Taps, 1,780; made by city for $1.50. Services, lead and iron; paid for by consumer. Hydrants, 115. CONSUMPTION.—(Galls.) av., 450,000; max., 550,000; min., 350,000. PRESSURE.—Ordinary, 56 lbs. Steam fire engines are sometimes used. FINANCIAL.—Cost, $115,000. Bonded debt, $53,500, at 4%, due 1906. Expenses, $6,040: Operating, $4,000; int., $2,040. Op. exp. and int. consumes 40% of revenue, new construction 10%, balance goes for redemption of bonds. Revenue, $10,000. MANAGEMENT.—Chn., Jno. A. Vandegrift; Secy., Geo. Womsley; Treas. and Supt., Geo. A. Allison. Rept. by Treas., July 11. SEWERS.—None. REFERENCE.—Eng. News, Jan. 21, '82.

16. **CAMDEN,** Camden Co. (58,313.) Owned by city. Built in '53 by Co., sold to city in '70. SUPPLY.—Delaware River, pumping to reservoir and stand-pipe. PUMPS.—Cap., 15,000,000 galls.; two Blake, 10,000,000 and 5,000,000. Bituminous coal used; av. cost, $2.20 per short ton. RESERVOIR.—Cap., 8,000,000 galls., at Pavonia. STAND-PIPE.—Cap., 85,000 galls.; 10 × 145 ft., on stone foundation. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 78 miles; cost extensions met by assessment on frontage of property. Taps, 9,700; made by city. Services, lead; paid for by owner. Meters, 8; owned, controlled and repaired by city. Use of meters compulsory for manufactories. City can compel use of meters and any consumer may have one. Hydrants, public, 568; private, 28. CONSUMPTION.—(Galls.) av., 12,000,000; max., 16,000,000; min., 11,000,000. PRESSURE.—Ordinary, 56 lbs. Steam fire engines are used. FINANCIAL.—Cost, $540,000. Debt, $390,000, at 4½%. Expenses, Operating, $35,000. Revenue (in '90), $130,667. MANAGEMENT.—Chn., Jno. T. Roberts; Secy., F. S. Fithian; Treas., Geo. G. Felton; Supt., Wm. W. Mines. Rept. by Secy., June 5. PROJECTED IMPROVEMENTS.—New supply from artesian wells, including 2—10,000,000 Holly-Gaskill hor. high duty pumps and force main. Contr., Geo. Pfeffer, Camden. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 28, '82.

17. **CAPE MAY CITY,** Cape May Co. (2,136.) Built in '74 by city. SUPPLY.—Surface wells, by gravity to tanks, with pumping as auxiliary. PUMPS.—Cap., 4,000,000 galls.; Worthington: 2,000,000 comp. non-cond. and 2—1,000,000, style not given (rept. by makers). TANKS.—Cap., 130,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 700. Hydrants, 80. CONSUMPTION.—(Galls.) av., 350,000. FINANCIAL.—Cost, $35,000. Debt, $2,800, at 5%. Expenses, $1,500. Revenue: Consumers, $7,690. NOTE.—No report since '90-1 Manual.

D 1. **CAPE MAY COURT HOUSE,** Cape May Co. (Est., 879.) Built in '95 by Cape

May Court House Water Co. for domestic supply to a few families. Cap. Stock: Authorized, $25,000; paid-up, $6,000. Prest., Alex. R. Springer; Secy. and Treas., W. W. Hartel.

39. **CARLSTADT,** Bergen Co. (Est., 2,851.) Supply from Hoboken.

P 4. **CARTERET,** Middlesex Co. See Woodbridge.

18. **CLAYTON,** Gloucester Co. (1,807.) Built in '95 by Borough of Clayton Water Co.; put in operation in Oct. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. SUPPLY.—Driven wells, pumping to tank. PUMPS.—Two Deane. Anthracite pea coal used. TANK.—Cap., 91,800 galls.; iron, 25 × 25 ft., on iron trestle 100 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles, w. i., cement-lined. Taps, 43; made for $3.50. Services, iron and lead; paid for by consumer. Meters, 22; owned, controlled and repaired by Co.; yearly rental, 10% of cost. Use of meters optional with Co. Hydrants, 40. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Treas., J. W. Hawley; Secy., H. Bayard Hodge, Philadelphia. Supt., Silas Gray. Rept. by American Pipe Mfg. Co., Philadelphia, June 8.

39. **CLIFFSIDE,** Bergen Co. (Not given.) Supply from Hoboken.

P 1. **CLINTON,** Hunterdon Co. (1,975.) Projected by J. M. Johnson, H. G. Frederick, Wm. H. Johnson and others under name of Clinton Water & Water Supply Co. Work is to be begun Mar. 1, '97, and it is expected to have plant in operation in June. Engr., M. M. Dreibelbis, Hamburg, Pa. No contr. Franchise, 50 yrs. from '96. Contract with borough for 10 yrs. for public service at $575 per yr. at start. Supply, mountain springs, three miles distant, by gravity to distributing reservoir. Reservoir, cap., 1,000,000 galls. Mains, 7 miles. Taps will be made by Co. for $5. Services, iron; paid for by Co. to curb. Hydrants, public, 24. Probable cost, $40,000. Prest., J. M. Johnson, Millersburg, Pa.; Secy., Chester Tomson; Treas., H. G. Frederick, Millersburg, Pa. Rept. by Treas., Nov. 23.

40,57. **CLINTON TOWNSHIP,** Essex Co. (3,684.) See Irvington and Newark.

19. **COLLINGWOOD,** Camden Co. (539.) Built in '91 by Co.; put in operation in June. Engr., I. S. Cassin. Contrs., R. D. Wood & Co., Philadelphia, Pa. SUPPLY.—Natural springs, by gravity. STAND-PIPE.—Cap., 587,600 galls.; 10 × 100 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 265; made by Co. Meters, 8; owned by consumer; controlled by Co. Hydrants, 17. CONSUMPTION.—(Galls.) av., 25,000. FINANCIAL.—Cost, about $50,000; Cap. Stock: Authorized, $25,000. Debt, $13,500: Floating, $3,500; bonded, $10,000, at 6%. Expenses: Operating, $200. MANAGEMENT.—Prest., G. Frank Davis, Haddonfield; Secy., Benj. Stoker; Treas., Geo. W. Stoker; Supt., W. S. Johnson. Rept. by Secy., Dec. 22. SEWERS.—None.

57. **COLUMBIA HEIGHTS,** Essex Co. (Not given.) See Vailsburg.

26. **CRANFORD,** Union Co. (1,717.) See Union Water Co., Elizabeth.

20. **DARLINGTON,** (No P. O.) Monmouth Co. (Not given.) Built in '95 by the Deal Beach Land Co.; put in operation July 13. Engr. and Contr., S. L. Bartholomew, Asbury Park. No legal difficulties. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Cap., 720,000 galls.; Worthington comp. TANK.—Cap., 60,000 galls.; 20 ft. high, on 30 ft. tower. DISTRIBUTION.—Mains, 8,000 ft., 8 and 4-in. pipe. Taps, 13. Co. can compel use of meters and any consumer may have one. Hydrants, 6. CONSUMPTION.—(Galls.) av., 15,000 for June, July and Aug. Water only used in these three months. PRESSURE.—Ordinary, 24 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $8,800. Expenses: Operating, $300, three months. MANAGEMENT.—Secy., Milan Ross, Asbury Park. Rept. by S. L. Bartholomew, June 27. SEWERS.—Has sanitary and storm sewers.

21. **DECKERTOWN,** Sussex Co. (Est., 1,200.) Built in '96 by borough; was to be put in operation Jan. 1, '97. Consult. Engr., C. C. Vermeule, 71 Broadway, N. Y. city; Constr. Engr., A. H. Konkle, Newton. SUPPLY.—Lake Rutherford, by gravity, from outlet of lake. RESERVOIRS.—Cap., 172,500,000 galls.; Lake Rutherford: 170,000,000; formed by rubble and concrete dam, 6½ miles from borough; Coleville Intake; 2,500,000; formed by earth dam, 5½ miles from borough. DISTRIBUTION.—Mains, 9½ miles. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., est., 75,000. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Cost, $45,000, exclusive of land and water rights. Bonded debt, $60,000, at 5%. MANAGEMENT.—Prest., Chas. A. Wilson; Secy., W. S. Vanderhoff; Treas., C. C. Kyte. Rept. by Consult. Engr., Nov. 30. SEWERS.—None.

39. **DELFORD,** (No P. O.) Bergen Co. (Not given.) Supply from Hoboken.

22. **DOVER,** Morris Co. (Est., 5,000.) Built in '87 by Dover Water Co. FRANCHISE.—10 yrs. from '87. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $40 each for first 50 hydrants and $35 for each additional. SUPPLY.—Springs, by gravity to reservoir. In '89 there were 15,320 ft. of terra cotta collecting pipes. RESERVOIRS.—Cap., 6,000,000 galls.; 2—3,000,000. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 10 miles; cost extensions met by bonds reserved for that purpose. Taps, 368; made by Co. for $3. Services, lead and galv. i.; paid for by property owner or consumer. Meters, 212; owned, controlled and repaired by Co. Co. can compel use of meter and any consumer may have one. Hydrants, public, 78; private, 6. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 90 lbs. Steam fire engines are used on hilly part of city. FINANCIAL.—Cost, $115,000. Cap.

Stock: Authorized, $60,000; all paid-up. Bonded debt, $78,000, at 6%; due 1916. Expenses, $6,980: Operating, $1,700; int., $4,680; taxes, $600. Revenue, $7,655: Consumers, unmetered, $1,500; metered, $3,100; City, fire protection, $2,980; street sprinkling, $75; public buildings, free. MANAGEMENT.—Prest., C. C. Pomeroy; Secy. and Treas., Chas. E. Kimball, 45 Wall St., New York; Rept. by Supt., P. J. H. Bassett. Supt., June 24, '90.

23. **EAST ORANGE AND BLOOMFIELD,** Essex Co. (East Orange, 13,282; Bloomfield, 7,708.) Built in '82 by Orange Water Co. Supplies Glen Ridge borough, formerly part of Bloomfield and included in population given above. FRANCHISE.—Perpetual. Original contracts expired in '92 and have since been renewed to July, 1902, at $30 per hydrant per yr. Private rates not to exceed those charged for similar purposes in Newark. No legal difficulties. SUPPLY.—Wells, pumping direct (see note). Original wells 24, 50 and 100 ft. in diam.; in '89 three wells and a connecting gallery were added. PUMPS.—Cap., 3,000,000 galls.; Worthington comp. non-cond. (Also 1,500,000 Holly-Gaskill hor. high duty rept. by makers.) FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 80 miles. Taps (in '90), 2,300. Meters (in '90), 150. Hydrants, 500. PRESSURE.—Ordinary, 45 lbs.; fire, 70 lbs. No steam fire engines used. FINANCIAL.—(In '90.) Cost, $550,000. Cap. Stock: Authorized, $600,000. No debt. MANAGEMENT. Address Co. at East Orange. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News. Mar. 10, '86. NOTE.—Montclair Water Co. has contract to supply water to Orange Water Co. for Bloomfield (wholly or in part). See Montclair.

39. **EAST RUTHERFORD,** (No P. O.), Bergen Co. Supply from Hoboken.

24. **EGG HARBOR CITY,** Atlantic Co. (1,439.) Under construction in '96 by Egg Harbor City Water Co. Engr., Wm. H. Boardman, 2320 Tulip St., Philadelphia, Pa. FRANCHISE.—25 yrs. from '96; provides for purchase of works by city at any time. City to pay $40 per hydrant per yr. SUPPLY.—Artesian wells, pumping to stand-pipe. STAND-PIPE.—Cap., 587,000 galls.; 10 × 100 ft. DISTRIBUTION.—Mains, 6 miles. FINANCIAL.—Cap. Stock, authorized, $50,000. MANAGEMENT.—Prest., Geo. Pfeiffer, Jr., Camden; Secy., S. C. Smith, Camden; Treas., Seldon Twitchell.

25, 26. **ELIZABETH,** Union Co. (37,764.) Built in '54 by Elizabethtown Water Co. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—30 artesian wells and Elizabeth River, pumping to reservoir. Drainage area, 17.4 sq. miles. PUMPS.—Cap., 6,000,000 galls.; Davidson, 3,500,000; Worthington, 2,500,000. Chestnut coal used; av. cost, $3.65 per short ton. FILTERS.—Cap., 6,000,000 galls.; charcoal. RESERVOIRS.—Cap., 212,000,000 galls.; impounding, 150,000,000; storage, 50,000,000; high service, 12,000,000. FISCAL YEAR CLOSED in Nov. DISTRIBUTION.—Mains, 75 miles; cost extensions met by earnings. Taps, 5,600; made by Co. Services, galv. i.; paid for by consumer. Meters, 50; owned and controlled by consumer; repaired by Co. Use of meters optional with Co.; compulsory for manufacturers. Hydrants, 260. CONSUMPTION.—(Galls.) av., 4,000,000; max., 6,000,000; min., 3,500,000. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $1,000,000. Bonded debt, $400,000, at 4%. Expenses, taxes, $4,000. Revenue: City, fire protection, $6,500; street sprinkling, $25 per month for each cart. MANAGEMENT.—Prest., Jno. Kean, Jr.; Secy. and Treas., Jno. W. Whelan; Supt., Wm. Whelan; Ch. Pump. Engr., Louis Bitchoffhausen. Rept. by Engr., L. B. Battin, June 5. SEWERS.—Has sewers. REFERENCE.—Eng. News, Oct. 29, '81. NOTE.—Feb. 16, '97 (since above was written), L. B. Battin, Engr. of Co., rept. that Co. had recently added to its supply a pumping station at the Hummocks, near town of Union. Includes 46 artesian wells (probably the 30 named above are part of this number), 8 to 12 ins. in diam. and 46 to 580 ft. deep; also air-lift plant with 250-HP. Rand cross-comp. compressor (rept. by makers as 18 and 20 × 30-in.). On 15-day test wells developed a little over 6,000,000 galls. per day, and from Nov. 1 to Feb. 16, av. dy. yield of 27 was 5,000,000 galls. At present water from wells flows to reservoir in bed of tributary stream. Makers rept. a 2,500,000-gall. Worthington pump sold for use at Elizabethtown, N. J. (no such P. O.); this may be for use here.

UNION WATER CO.

Supplies Fanwood, Westfield, Cranford and Roselle with water from wells of Plainfield Water Supply Co., at Netherwood. Also conveys water from Plainfield to Elizabeth whenever the Elizabethtown Water Co. buys water from the Plainfield Co. Union Water Co. has about 25 miles of pipes, with hydrants located in the different villages. Rept. by Frank Bergen, of Union Water Co., Dec. 3, '96. Directors of Co. in '95 were rept. as John Kean, Jr., Frank Bergen, Foster M. Voorhees and others.

NOTE.—No further information can be obtained from Co., but from press repts. it appears that the several municipalities were first supplied in '92. Cranford contract extends 5 yrs. from '92, according to rept. from Edmund B. Horton, Cranford, Nov. 30, '96. See note regarding Elizabethtown Water Co. above.

39. **ENGLEWOOD,** Bergen Co. (4,785.) Supply from Hoboken.

39. **ENGLEWOOD CLIFFS** (No P. O.), Bergen Co. Supply from Hoboken.

27. **ESSEX FELLS** (P. O. Caldwell), Essex Co. (Est., 200.) Built in '98 by Jno. R. Fells' estate. Engr., Chas. W. Leavitt, Jr. SUPPLY.—Springs, pumping to elevated tank. PUMPS.—Cap., 500,000 galls.; two Worthington. ELEVATED TANK.—Cap.,

70,000 galls. DISTRIBUTION.—Mains, 2 miles. Meters, none. Hydrants, 20. CONSUMPTION.—(Galls.) av., 25,000. FINANCIAL.—Withheld. MANAGEMENT.—John R. Fells' estate. Rept. by Chas. W. Leavitt, Jr., 15 Cortland St., N. Y. City.

39. **FAIRVIEW,** Bergen Co. Supply from Hoboken.

26. **FANWOOD,** Union Co. See Union Water Co., Elizabeth.

28. **FLEMINGTON,** Hunterdon Co. (Est., 2,000.) Built in '64 by Flemington Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not fixed by city. SUPPLY.—Springs and South branch of Raritan River, by gravity and pumping. PUMPS.—Cap., not given; from Southwark Machine Co. Anthracite coal used; av. cost, $5 per short ton. RESERVOIR.—Cap., 650,000 galls. Storage and distributing. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 13 miles. Taps, 165; made by Co. Services, iron; paid for by owner. Meters, 1; owned and controlled by Co. Hydrants, 21. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cost, $39,000. Cap. Stock, authorized, $25,000; all paid-up. Bonded debt, $15,000, at 5%; due 1914. Revenue, $5,650: Consumers, $4,900; City, fire protection, $500; street sprinkling, $250. MANAGEMENT.—Prest., J. A. Bullock; Secy., Treas. and Supt., Jno. B. Hopewell. Rept. by Supt.

60. **FRANKLIN TOWNSHIP,** Essex Co. (2,007.) See Nutley.

29. **FREEHOLD,** Monmouth Co. (2,932.) Built in '90-1 by town. SUPPLY.—12 artesian wells, pumping to stand-pipe; wells connected by siphon to receiving well. PUMPS.—Cap., 1,150,000 galls; Deane 750,000, comp. dup.; Buffalo water power, 400,000. Bituminous coal used; av. cost, $2.80 per short ton. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 9¼ miles; cost extensions met by taxation. Taps, 301; made by city for $3. Services, iron; paid for by owner. Meters, 18; owned, controlled and repaired by city; yearly rental, 10% of cost. Use of meters optional with city; compulsory for manufacturers, railroads and hotels. Hydrants, public, 5; private, 1. CONSUMPTION.—(Galls.) av., 150,000; max., 225,000; min., 80,000. PRESSURE.—Ordinary, 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $55,000. Bonded debt, $50,000, at 4%. Expenses, $5,300; operating, $3,300; int., $2,000. MANAGEMENT.—Prest., A. C. Hartshorne; Secy., Jno. Enright; Supt., S. P. Voorhees; Ch. Pump. Engr., Geo. Kelsy. Rept. by Secy., June 6. SEWERS.—Has sanitary sewers only.

30. **GARFIELD,** Bergen Co. (Est., 500.) Built in '95 by Garfield Water Co.; put in operation Feb. 1. Engr., Wolcott C. Foster, 52 Broadway, N. Y. city. Contr., Geo. H. Du Buisson, Montclair. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $25 per hydrant for fire protection; meter rates for other purposes. Hydrant contract 10 yrs to Apr. 1, 1906. LEGAL DIFFICULTIES.—Injunction served to prevent building works and to test the validity of franchise; decided in favor of the company, July to Oct., 95. SUPPLY.—Deep wells, pumping to elevated tanks; direct pumping in case of fire. PUMPS.—Cap., 750,000 galls.; Snow direct acting comp. dup. Anthracite pea coal and screenings used. TANKS.—Two: Temporary elevated, cap., 45,000 galls.; storage, 60,000 galls.; both wood. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by sale of securities and surplus earnings. Taps made by Co. for $3 for ½-in, $4 for ¾-in., $5 for 1-in. Services, galv. i. or lead at option of owner; paid for by property owner. Meters: 7; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for factories and large consumers and for unusual purposes. Meters will eventually be put on all services, but as town is not sewered they are not put on at present ordinarily for domestic service. Hydrants, 20. CONSUMPTION.—Unknown as yet. PRESSURE.—Ordinary, 30 lbs.; fire, 75-100 lbs. FINANCIAL.—Cap. Stock: Common: Authorized, $20,000; paid-up, $18,000; Pref'd, authorized, $10,000, all paid-up. 6% div'd guaranteed. No debt. Expenses: Operating (about), $900 to $1,000, including taxes. Revenue: City, fire protection, $500. Deficit of first quarter made up and balance left to profit since; exact amount undetermined. MANAGEMENT.—Prest., H. W. Southworth; Secy., W. C. Foster; Treas., Albert G. Duysters, all of N. Y. City; Ch. Pump. Engr., Danl. Cody. Rept. by Secy., June 17. PROJECTED IMPROVEMENTS.—About 1½ miles additional mains. SEWERS.—None.

31. **GLASSBORO,** Gloucester Co. (2,642, town.) Built in '96 by Township of Glassboro Water Co. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. SUPPLY.—Borough of Clayton Water Co. STAND-PIPE.—Cap., 70,500 galls.; 20 × 80 ft., on iron trestle 100 ft. high. DISTRIBUTION.—Mains, 9¼ miles. Hydrants, 36. PRESSURE.—Ordinary, 35 to 40 lbs.; fire, 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jos. S. Keen, Jr.; Secy., H. B. Hodge; Treas., N. B. Cox; Supt., G. A. Nitshy, Jr. Rept. by Secy., Nov. 9.

D 2 **GLEN GARDNER,** Hunterdon Co. (Est., 480.) Built by Glen Gardner Water Co. for domestic use. Supply, mountain spring, by gravity. Fiscal year closed Sept. 14. Mains, 1 mile. Taps, 40; made by Co. Pressure, ordinary, 75 lbs. Cost, $2,000. Cap. Stock: Authorized, $2,000; all paid-up; paid 5% div'd in '96. No debt. Prest., P. Martems; Secy., J. M. Shannon; Treas., Geo. D. Lair. Rept. by Secy., Sept. 19. No sewers.

23. **GLEN RIDGE,** Essex Co. See East Orange.

32. **GLOUCESTER CITY,** Camden Co. (6,564.) Built in '83-4 by city. SUPPLY.—Springs and Newton Creek, pumping from reservoir to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Wetherill comp. RESERVOIR.—Cap., 2,000,000 galls. STAND-PIPE.—Cap., 145,000 galls.; 18 × 75 ft. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 4 miles. Taps, 994. Services, galv. i. Meters, 1. Hydrants, 80. CONSUMPTION.—(Galls.) av., 500,000. FINANCIAL.—Cost, $125,000. Bonded debt, $78,000: $20,000 at 6%, due 1914—28; $18,000 at 5%, due 1924—32; $4,000 at 4%, due in annual payments of $2,000 after '93. Expenses: Operating, $1,881. Revenue: Consumers, $5,208. MANAGEMENT.—Supt., H. M. Hailey; Ch. Pump. Engr., Jno. Lane.

39. **GUTTENBERG,** Hudson Co. (1,947.) Supply from Hoboken.

39. **HACKENSACK,** Bergen Co. (6,004.) Supply from Hoboken. REFERENCE.—Eng. News, May 2, '85.

33. **HACKETTSTOWN,** Warren Co. (2,417.) Built in '60 by village under name of Hackettstown Aqueduct Co. SUPPLY.—Streams, by gravity. FILTERS.—At reservoir; sand, gravel, charcoal. RESERVOIR.—Area ¾ acre; about 100 ft. above village. Press repts. in '96 stated new reservoir was being built on Mine Hill Brook. DISTRIBUTION.—Mains, 10. Taps, 350. Meters, 0? Hydrants, 40. FINANCIAL.—Cost, $54,000. Bonded debt, $58,500 at 5, 6 and 7%. Revenue: Consumers, $5,000. NOTE.—No report since '88. REFERENCE.—Eng. News, Aug. 26, '82.

34. **HADDONFIELD,** Camden Co. (2,502.) Built in '86 by Haddonfield Water Supply Co. SUPPLY.—Stream, pumping from impounding reservoir to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Worthington: 1,000,000 simple high pressure and 500,000 comp. non-cond. (Kept. by makers in '96.) RESERVOIR.—Cap., 2,000,000 galls.; impounding; area, 1 acre. STAND-PIPE.—Cap., 145,000 galls.; 15 × 110 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 190. Meters: 27. Hydrants, 21. CONSUMPTION.—(Galls.) av., 25,000. FINANCIAL.—Cost, $40,000. NOTE.—No report since '90-1 Manual.

35. **HARRISON,** (P. O. Newark) Hudson Co. (8,338.) Built in '86 by village. SUPPLY.—Jersey City Water-Works. DISTRIBUTION.—Mains, 8 miles. Taps, 780. Hydrants, 80. FINANCIAL.—Revenue, $12,480. MANAGEMENT.—Water Purveyor, Geo. H. Cuper. Rept. by B. P. Walsh, Town Clerk, Nov., '96.

39. **HASBROUCK HEIGHTS,** Bergen Co. Supply from Hoboken.

36. **HIGHLANDS OF NAVESINK,** (P. O. Navesink.) Monmouth Co. (Not given.) Built in '96 by Highlands Water & Light Co. Supplies water for domestic use and fire protection. Engr., F. A. Dunham, Plainfield; Contrs., Hayward & Co., Highlands. SUPPLY.—Springs and driven wells, pumping to reservoir or tank. FINANCIAL.—Cap. Stock: Common, authorized, $50,000; paid-up, $5,000. MANAGEMENT.—Prest., Ferdinand Fish; Supt., C. W. Humphreys. Rept. by Prest., Nov. 12, '96.

37. **HIGHTSTOWN,** Mercer Co. (1,875.) Built in '95 by borough; put in operation Dec. 1. Engrs., L. S. Cassin & Son, Philadelphia. FRANCHISE.—Rates are subject to regulation by city. Co. is exempt from local taxes, but receives no compensation for public service. No legal difficulties. SUPPLY.—Four artesian wells, 203 to 206 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 24,000 galls.; Barr comp. dup. direct acting. Anthracite pea coal used; av. cost, $2.89 per short ton. STAND-PIPE.—Cap., 84,000 galls.; flange steel; 12 × 100 ft. DISTRIBUTION.—Mains, about 3 miles. Taps, 106; made by borough. Services, w. i.; paid for by property owner. Meters, 0. Borough can compel use of meters and any consumer may have one. Hydrants, 27. CONSUMPTION.—(Galls.) av., 25,000; max., 50,000, in summer. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 5%; due 1920. Expenses: Operating, $600; taxes, none. Revenue, public buildings, $13. Deficits are all met by taxation. MANAGEMENT.—Prest. and Treas., Wm. T. Smock; Secy., W. I. Norton; Ch. Pump. Engr., Geo. W. F. Bennett. Rept. by Prest., Nov. 18. SEWERS.—None.

38, 39. **HOBOKEN,** Hudson Co. (43,648; est. pop. supplied, 145,000.)

CITY WORKS.

Distribution system built in '55 and water bought from Jersey City until '82. Since '82 water has been supplied and works operated by Hackensack Water Co. (see below), city still owning most of the distribution system. A 15-yr. contract between city and Co. expired in Nov., '96. Under old contract city seems to have collected rates and paid over about 90% to Co. For 9 months ending Feb. 1, '97, collections were about $38,403 for unmetered and $73,115 for metered water, together with $3,033 tapping fees, etc. In same period city paid $8,607 for salaries, etc., and $2,245 for int.

HACKENSACK WATER CO., REORGANIZED.

Works now owned by this Co. were built in '82. Supplies Hoboken (see above), West Hoboken, town of Union, township of Union, Guttenberg (since '89), North Bergen and Weehawken (both since '82), in Hudson Co.; Hackensack (since '74), Englewood (since '88), Rutherford (since '91), East Rutherford, Carlstadt, Wallington, Hasbrouck Heights, Little Ferry, Bergen Township, Lodi Township, Maywood, Riverside, Delford, Schraalenburg, Bergen Fields, Tenafly, Englewood Cliffs, Leonia, Ridgefield Park, Ridgefield (since

'82), Fairview and Cliffside, in Bergen Co. Since '84 the Co. has aerated its water supply. This has been a continuous operation about 7 mos. in each year, from Apr. 15 to Nov. 15. Work is done through reservoirs, two principal ones being located about a mile apart. Air is forced through a 6-in. c. i. pipe by an air compressor from one reservoir to the other. Top of each is encircled by 3-in. w. i. pipes from which at intervals of about 100 ft. a 2-in. w. i. pipe is laid down the slope of the reservoir; to which is attached at right angles a perforated pipe about 6 ft. long lying on the bottom of the reservoir. Each discharge pipe has gate near top of bank for regulating air. Rates are regulated by contract. Co. is not exempt from local taxes. Fire hydrant service ranges from nothing in Hoboken to $35 per annum each in the outlying districts. No legal difficulties. SUPPLY.—Hackensack River at New Milford, by pumping. Drainage area, 118.4 sq. miles. PUMPS.—Cap., 21,000,000 galls., at main station, and others for re-pumping, as noted. All Worthington. New Milford: 10,000,000 and 5,000,000 high duty and 2—8,000,000 low duty, all comp., and constructed to work against 300 ft. head. Weehawken High Service: 4,000,000 high duty and 2—2,000,000 low duty, all comp. and constructed to work against 125 ft. head. Englewood High Service: 2—2,000,000 low duty comp., constructed to take water under 200 ft. head and deliver under 600 ft. head. Pea coal used; av. cost, $2.65 per short ton. No filters, water is aerated as above. RESERVOIRS.—Cap., 48,153,000 galls. Two distributing, at Weehawken: 30,000,000, 190 ft. above tide water; 15,000,000, 180 ft. above tide water. Carlstadt: 377,000, 190 ft. above tide. Hackensack: 2,776,000, 110 ft. above tide. STAND-PIPES OR TANKS.—Total cap., 714,885 galls. Weehawken: 150,000, elev., 300 ft.; 385,000, brick, elev., 167 ft. Englewood: 165,000, elev., 459 ft.; 3,000, elev., 190 ft. Hackensack: 5,885, elev., 112 ft. Shady Side: 3,000, elev., 168 ft. Edgewater, 3,000, elev., 161 ft. FISCAL YEAR CLOSED Oct. 31, '96. DISTRIBUTION.—Mains, 207 miles c. i.; cost extensions met by sale of bonds or stock, revenue being guaranteed by abutting property owners. Taps, 13,144; made by Co. for $11 and upwards, including stop cocks and curb box. Services, lead; paid for by property owner. Meters: 10,866; owned, controlled and repaired by Co., except in case of freezing or other misuse. Use of meters optional with Co.; compulsory for all new consumers since '84. Hydrants, public, 1,126. PRESSURE.—Ordinary, 45 to 60 lbs. Steam fire engines are used. MANAGEMENT.—Prest., R. W. de Forest, 30 Broad St., N. Y. City; Secy., Wm. Shippen, Morristown; Treas., E. A. Stevens; Ch. Engr. and Supt., Chas. B. Bush; Dep. Supt., D. W. French. Rept. by Ch. Engr. and Supt., Jan. 9, '97. SEWERS.—Has sewers generally. REFERENCE.—Eng. News, May 2, '85; water tower at Weehawken, Nov. 6, '86, illus.

40. **IRVINGTON,** Essex Co. (Est., 1,897.) Now owned by Clinton Water Co. Built in '94 by Irvington Water Co.; put in operation July 1. In '96 was consolidated with the Clinton Township Water Co., formed that year, under the name of the Clinton Water Co. Engr. and Contr., Geo. P. Olcott, East Orange. FRANCHISE.—24 yrs. from '94. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Newark works, by gravity. FISCAL YEAR CLOSED June 8. DISTRIBUTION.—Mains, 8 miles; cost extension met by issue of stock. Taps, 250; made by Co. for $15. Services, lead; paid for by consumer. Meters, 100; owned by consumer; controlled and repaired by Co. Use of meters compulsory for all having over one faucet. Co. can compel use of meters and any consumer may have one. Hydrants, public, 52; private, 3. PRESSURE.—Ordinary, 40 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $43,000. Cap. Stock: Authorized, $100,000; paid-up, $40,000; paid 3½% div'd in '96. Bonded debt, $15,000, at 6%, due in 1910. Sinking Fund: $900, at 3%, invested in Fidelity Title & Deposit Co. of Newark. Expenses: Int., $900; taxes, $1,280. Revenue, $3,800: Consumers, unmetered, $1,000; metered, $1,200; City, fire protection, $1,200; public buildings, $100; other purposes, $300. MANAGEMENT.—Prest., Jas. R. English; Secy. and Supt., Thos. H. Jones; Treas., Thos. S. Osborne. Rept. by Supt., Dec. 17. SEWERS.—None.

41. **JERSEY CITY,** Hudson Co. (163,003.) Built in '52 by city. Supplies Bayonne, Kearney Township and Harrison, but supply from another source for Bayonne about ready Jan., '97. SUPPLY.—Pequannock River supply of East Jersey Water Co. (see Newark), by gravity, with Passaic River, pumping to reservoir, for emergency. PUMPS.—Cap., 29,000,000 galls.; Galloway; also Worthington as follows: 2—8,000,000 and 1—8,000,000 comp. cond.; 5,000,000 hor. comp. high duty. RESERVOIRS.—Cap., 247,000,000 galls. Belleville Receiving, est., 10,000,000; Bergen Hill Storage, originally, 167,000,000; Bergen Hill Distributing, 70,000,000; flow line, 125 ft. above tide. STAND-PIPES.—Two, inclosed in masonry tower 210 ft. high. One 6½ ft. at bottom, 4 ft. at top, 160 ft. high; one 6 × 160 ft.; both iron and both inclosed by one masonry tower. First one fell in '69 and was rebuilt. SUPPLY MAINS.—Three, each 22,300 ft. long, 17,500 ft. being across meadows; one 20-in. c. i., other two, 36-in.; one w. i. and cem., other w. i. and cem. to meadows, then c. i. DISTRIBUTION.—(In '87.) Mains, 175 miles. Taps, 20,456. Meters, 240. Hydrants, 1,738. CONSUMPTION.—(Galls.) av., 19,300,000. FINANCIAL.—(In '87.) Cost, $4,950,000. Debt, $4,838,000. Expenses: Operating, $539,170. Revenue: Consumers, $514,428. MANAGEMENT.—Ch. Engr., W. W. Ruggles. PROJECTED IMPROVEMENTS.—New supply. Dec. 4, '96, contract for gravity supply of 50,000,000 dy. cap. was awarded to East Jersey Water Co., 2 Wall St., N. Y. City. Board of Finance soon after concurred in award, but up to Feb. 4, '97, Mayor had not approved same. Proposed supply, Rockaway River, 66.4 sq. miles drainage area of upper section; impounding reservoirs and one steel conduit to present high service reservoirs. City to buy water by

1,000,000 galls., with option of buying works. SEWERS.—Has sewers. REFERENCES.—Eng. News, June 4, '81; stand-pipe failure, Apr. 5, '94; history, Apr. 25, '95; filtration of Passaic, Apr. 2, '96; report on proposed contract with East Jersey Water Co., Jan. 21, '97. NOTE.—No official rept. received.

42. **KEARNEY** (P. O., Arlington), Hudson Co. (7,064.) Built in '87 by township. SUPPLY.—Jersey City Water-Works. Contract has been made with the East Jersey Water Co. for water, but service has not been begun. Press rept. states contract price is $90 per 1,000,000 galls., and that contract runs 13½ yrs. from June, '97. DISTRIBUTION.—Mains, 13 miles. Taps, 230. Services, lead. Meters, 70. Hydrants, 94. FINANCIAL.—Cost, $81,400. Bonded debt, $82,000. Expenses, $9,459: Operating, $4,959; City, $4,500. Revenue, $6,940. MANAGEMENT.—Water Purveyor. SEWERS.—Has sewers. NOTE.—No report since '90-1 Manual.

43. **KEYPORT,** Monmouth Co. (3,411.) Built in '93 by town; put in operation in June. Engrs., I. S. Cassin & Son, Philadelphia. SUPPLY.—Six artesian wells, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; Worthington comp. non-cond. Anthracite pea coal used; av. cost, $3.45 per short ton. FILTERS.—Cap., 500,000 galls.; Warren; combined aeration, lime and alum treatment to remove iron. STAND-PIPE.—Cap., 290,000 galls.; 20 × 125 ft. DISTRIBUTION.—Taps, 225; made by town for $7, including service to curb. Services, galv. i.; paid for by property owner from curb. Meters, 100; owned, controlled and repaired by consumers. Use of meters compulsory for all who use hose. Town can compel use of meters and any consumer may have one. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $55,000. Expenses: Operating, $1,537. Revenue: Consumers, $1,682. Deficits are met by taxation. MANAGEMENT.—Prest., Rufus Ogden; Secy., T. H. Roberts; Treas., C. Anderson. Rept. by Secy., Aug. 13. SEWERS.—None. REFERENCE.—Warren filters, Eng. News, June 4, '96, illus.

44. **LAKEWOOD,** Ocean Co. (Not given.) Built in '86 by Lakewood Water Co. SUPPLY.—South branch of Metedeconk River, pumping to stand-pipe. Min. dy. flow of stream, 4,120,000 galls. PUMPS.—Cap., 1,000,000 galls.; Worthington comp. non-cond. FILTERS.—Cap., 500,000 galls.; Hyatt (or New York). STAND-PIPE.—Cap., 117,500 galls.; 20 × 50 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 6¾ miles. Taps, 212. Meters, 0. Hydrants, 45. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Isaac A. Van Hise; Secy. and Treas., I. D. Davis. Rept. by Prest., Sept. 28. SEWERS.—Has sewers.

45. **LAMBERTVILLE,** Hunterdon Co. (4,142.) Built in '78 by Lambertville Water Co. FRANCHISE.—Rates not subject to regulation by city. No legal difficulties. SUPPLY.—Swan's Creek, by gravity. Drainage area, 1½ sq. mi. of trap formation. FILTER BEDS.—Cap., 250,000 galls.; area, 12,000 sq. ft.; filtering material, sand and gravel, av. depth 2½ ft., 4-in. vitrified pipe 2 ft. c. to c., at bottom of bed resting on broken stone and sand. RESERVOIRS.—Two; cap., 80,000,000 galls. FISCAL YEAR CLOSED Feb., '96. DISTRIBUTION.—Mains, 5 miles. Taps, 200; made by Co. for $11. Services, iron. Meters, 8; owned by consumer; controlled and repaired by Co. Use of meters compulsory for mills. Use of meters optional with consumer. Hydrants, public, 28; private, 1. CONSUMPTION.—(Galls.), min., 250,000. PRESSURE.—Ordinary, 71 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Chas. A. Skillman; Treas., F. W. Van Hart; Supt., T. Conyell. Rept. by Supt., Oct. 26. No sewers. REFERENCES.—Eng. News, Aug. 31, '81; sand filtration, July 2, '96, illus.; water purification, Oct. 15, '96.

39. **LEONIA,** Bergen Co. Supply from Hoboken.

39. **LITTLE FERRY,** Bergen Co. Supply from Hoboken.

D 3. **LITTLE YORK,** Hunterdon Co. (Est., 145.) Built to supply a Distilling Co. Distillery was abandoned and any one who wishes has free use of water. Supply, springs, by gravity. Mains, 500 ft. Consumers, 20. Address J. K. Fox.

39. **LODI,** Bergen Co. (5,131, town.) Supply from Hoboken.

46. **LONG BRANCH,** Monmouth Co. (7,231.) Built in '77 by Long Branch Water Supply Co. Supplies Monmouth Beach and Seabright. In '80 Monmouth Beach Water Co. built works and bought water from Long Branch Water Supply Co. until '82, when it was consolidated with Long Branch Co. In '87 Seabright Water Supply Co. built works for domestic supply; consolidated with Long Branch Water Supply Co. in '89. FRANCHISE.—10 yrs. from '89; does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $4,800 per year for public service. SUPPLY.—Brook and springs, filtered, pumping to stand-pipes. PUMPS.—Cap., 5,000,000 galls.; Worthington comp. cond., 2,000,000 and 3,000,000. Anthracite pea coal used; av. cost, $3.15 per short ton. FILTERS.—Cap., 3,000,000 galls.; Hyatt (or New York). RESERVOIR.—Cap., 6,000,000 galls.; impounding. STAND-PIPES.—One, cap., 152,000 galls.; 18 × 80 ft., and one, cap., 64,000, 12 × 76 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 30 miles. Taps, 1,350; made for consumer by licensed plumber; no fee. Services, galv. iron and lead; paid for by consumer. Meters, 2. Use of meters is compulsory in two special cases; not optional with consumers. Hydrants, public, 132; private, 2. CONSUMPTION.—(Galls.) av., 1,300,000; max., 2,828,650; min., 600,000. PRESSURE.—Ordinary, 39 lbs.; fire, 60 lbs. Steam fire engines are

used. FINANCIAL.—Cap. Stock (in '90), $250,000. Bonded debt (in '90), $100,000, at 5%. Revenue, City, $4,800. MANAGEMENT.—Secy., Whitney Conant. Rept. by Secy. SEWERS.—Has sanitary sewers only. REFERENCE.—Hyatt filters, Eng. News, Oct. 18, '88.

—? **LONGPORT,** Atlantic Co. (Not given.) Built in '95 by Longport Water & Light Co. for general supply. See note. SUPPLY.—By pumping. FINANCIAL.—Cap. Stock: Common (Apr., '95), authorized, $25,000; paid-up, $4,000. MANAGEMENT.—Incorporators: M. S. McCullough, W. W. Lamborn, Longport; W. H. Bartlett, Atlantic City; J. R. Remington, Philadelphia. NOTE.—Above from new incorporation returns and press repts. in '95. Place is a summer resort, near Atlantic City, and possibly works are in operation only part of year, or may have discontinued.

47. **LORRAINE,** (P. O. Roselle) Union Co. (Not given.) Built in '94 by Lorraine Water Co.; put in operation Jan. 1. Engr., Wm. J. Lansley, Elizabeth; Contr., Harding Johnson. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. No compensation for public service. No legal difficulties. SUPPLY.—From Netherwood wells, of Plainfield Works. See Union Water Co., under Elizabeth. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 2 miles; cost extensions met by increase in stock. Taps made by Co. for $5 to $10. Services, galv. t.; paid for by property owner. Meters: 2; owned, controlled and repaired by Co. Co. cannot compel and may prohibit use of meters. Hydrants, public, not given; private, 4. CONSUMPTION.—Small, as there are no sewers. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $3,000. Cap. Stock: Authorized, $10,000; paid-up, $3,000; paid 4% div'd in '95. No debt. MANAGEMENT.—Prest., Wm. A. Topping; Secy. and Supt., Wm. J. Lansley, Elizabeth; Treas., Henry S. Topping. Rept. by Secy., Sept. 1, '96. SEWERS.—None.

48. **MADISON,** Morris Co. (Est., 3,000.) Built in '90 by borough. SUPPLY.—Open wells, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; two Deane comp. dup. Anthracite pea coal used; av. cost, $3.25 per short ton. STAND-PIPE.—Cap., 270,000 galls.; steel, 25 × 75 ft. DISTRIBUTION.—Mains (in '90), 9½ miles; cost extensions met by taxation. Taps, 250; made for $15. Meters: 116; owned and repairs paid by consumer; controlled by borough. Borough can compel use of meters and any consumer may have one. Use of meters compulsory for various services. Hydrants, 122. CONSUMPTION.—(Galls.) av., 150,000; max., 225,000; min., 75,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—(In '90) Cost, about $62,000. Debt, $60,000. MANAGEMENT.—Rept. by Mgr., W. M. Ball, June 5. SEWERS.—None.

49. **MAPLE SHADE,** Burlington Co. (Not given.) Built in '94 by Maple Shade Land & Improvement Co. for general supply. SUPPLY.—Well, pumping to tank. FINANCIAL.—Cost, est., $3,000. MANAGEMENT.—Address Jas. McAlister. Rept. by H. E. Gilbert, Nov. 10, '96.

39. **MAYWOOD,** Bergen Co. Supply from Hoboken.

50. **MEDFORD,** Burlington Co. (1,864, town.) Built in '95 by Medford Water Co.; put in operation Aug. 23. Engr., H. C. Risdon, Mt. Holly. SUPPLY.—Creek, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Deane dup., driven by 20-HP. Otto gas engine. STAND-PIPE.—Cap., 80,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 2 miles; cost extensions met by revenue. Taps, 110; made by Co. for $3. Services, galv. t.; paid for by consumer. Hydrants, 20. CONSUMPTION.—(Galls.) av., 30,000; max., 50,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $11,000. Pref'd stock, paid-up, $9,000. Floating debt, $1,700, at 5%. Expenses: Operating, $300; taxes, $9. Revenue: City, fire protection, $300; other purposes, $1,000. MANAGEMENT.—Prest., Isaac W. Stokes; Secy., I. W. Garwood; Treas., J. Bowker; Supt. and Ch. Pump. Engr., Wm. B. Cooper. Rept. by Secy., June 17. SEWERS.—None.

51. **MERCHANTVILLE,** Camden Co. (1,225.) Built in '87-8 by Merchantville Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not fixed in franchise. SUPPLY.—Stream, fed by springs, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—500,000 Holly hor. dup. were formerly rept. RESERVOIR.—Cap., 810,000 galls. STAND-PIPE.—Cap., 37,600 galls.; 8 × 100 ft. DISTRIBUTION.—Mains, 9½ miles. Taps, 261. Hydrants, 40. CONSUMPTION.—(Galls.) av., 46,601. FINANCIAL.—Cost, $45,968. Cap. Stock: authorized, $50,000; paid-up, $15,000; paid 6% div'd in '90. Pref'd, authorized, $50,000. Bonded debt, $15,000 at 5%, due in 1906. Expenses, $2,362; Operating, $1,442; int., $865; taxes, $54. Revenue, $4,375: Consumers, $3,355; City, $1,020. NOTE.—No rept. since '90-1 Manual.

P 2. **METUCHEN,** Middlesex Co. (Est., 1,370.) Midland Water Co. proposes to build works if permission can be secured. Vote may be taken by people in May, '97. Co. was incorp. May 21, '96, with cap. stock of $200,000, $50,000 paid in, by Frank Bergen, Edw. M. Wood and others, Elizabeth. Press rept. states Jno. Kean, Elizabeth, is at head of Co., and that supply has been developed, or partially so, at New Brooklyn Pond, South Plainfield; also that Co. has contracted to supply Lehigh Valley R. R. Co.

39. **MIDLAND,** (P. O. New Milford) Bergen Co. (1,829.) Supply from Hoboken.

52. **MILLVILLE,** Cumberland Co. (10,002.) Built in '78 by Millville Water Co. FRANCHISE.—99 yrs. from '78. Rates are subject to regulation by city. Co. is exempt from local taxes, but receives no compensation for public service. No legal difficulties. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Wood water power and 1,250,000-gall.

Worthington simple high pressure. RESERVOIR.—Area, 1,100 acres; formed by dam ⅛ mile long, 25 ft. high. STAND-PIPE.—Cap., 110,000 galls.; iron, 12 × 132 ft. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 700; made by Co. Services, lead; paid for by consumer. Hydrants, public, 66; private, 25. CONSUMPTION.—(Galls.) max., 1,000,000; min., 300,000. PRESSURE.—Ordinary, 45 lbs.; fire, 54 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock: authorized, $25,000, paid-up, $20,000. MANAGEMENT.—Prest., Geo. Wood; Secy., N. G. Livermore; Treas., W. D. Kemble; Supt., R. W. Meredith. Rept. from proprietors. SEWERS.—None. REFERENCE.—Eng. News, Feb. 25, '82.

46. **MONMOUTH BEACH,** (P. O. North Long Branch) Monmouth Co. (Not given.) Supply from Long Branch.

53. **MONTCLAIR,** Essex Co. (8,656.) Built in '87 by Montclair Water Co. Co. has contract with Orange Water Co. to supply Bloomfield 10 yrs. from May 1, '95, and with West Orange for 25 yrs. from Nov. 1, '92. CHARTER. — 50 yrs. from '86. Contract for 10 yrs. from Dec. 1, '87; provided for purchase by town in '90 at 6% in advance of cost. Rates are not to be more than in Orange and East Orange. Co. is not exempt from local taxes. City to pay $26 per hydrant per yr. No legal difficulties. SUPPLY.—Wells and main conduit of the East Jersey Water Co. (see Newark), by pumping to tank. One dug well, covered, and several driven wells discharging by gravity into large one. Supply main connects with East Jersey conduit at Brookdale, where a 16-in. Venturi meter is placed. From Brookdale a 16-in. c. i. conduit extends nearly a mile, where it branches into two 12-in., one continuing about 1½ miles to Montclair pumping station, and one suplying water to Orange Water Co. for Bloomfield. PUMPS.—Cap., 3,500,000 galls.; 1,500,000 and 1,000,000 Snow dup. comp.; 2—500,000 Worthington comp. non-cond. Anthracite pea coal used; av. cost, $3 per short ton. TANK.—Cap., 300,000 galls.; 40 × 30 ft.; iron; at elev. of 680 ft. above tide-water. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 43 miles; cost extensions met by sale of bonds and income. Taps, 1,458; made by Co. for $5. Services, lead and iron; paid for by property owner. Meters: 291; owned by Co. and consumers; controlled and repaired by Co.; yearly rental, $2.50. Use of meters compulsory for livery stables, printing offices and motors. Co. can compel use of meters and any consumer may have one. Hydrants, public, 327; private, 9. CONSUMPTION.—(Galls.) av., 722,059. FINANCIAL.—Cap. Stock, $500,000; all paid-up; originally $1,000,000, but reduced one-half in '95 or '96. Bonded debt, $500,000, at 5%; 50-yr. bonds, dated Jan. 1, '96. Expenses: Taxes, $2,746. Revenue: Town, hydrant service, about, $8,000. MANAGEMENT.—Prest., Whiting G. Snow; Secy., Albert P. Fisher, Brooklyn, N. Y.; Treas., E. Le B. Gardiner, Ridgewood; Supt., Jas. Owen. Rept. from Co. in Dec., '96. SEWERS.—Has sanitary sewers. NOTE.—About one-half of the Bloomfield supply is by gravity.

54. **MOORESTOWN,** Burlington Co. (Est., 2,300.) Built in '88 by Moorestown Water Co. FRANCHISE.—50 yrs. from '87. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,140 per annum for 65 hydrants and sprinkling; press rept. says this is a 3-yr. contract, made in latter part of '96. No legal difficulties. SUPPLY.—Springs and Pensauken Creek, pumping direct and to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Blake high pressure dup., 1,000,000; Deane, comp. dup., 1,000,000. Lykens Valley coal used; av. cost, $3.35 per short ton, delivered. RESERVOIRS.—Cap., 1,000,000 galls.; area about 1½ acres; depth at dam about 8 ft. TANK.—Cap., 70,000 galls.; cedar; 35 × 20 ft., on brick tower 45 ft. high. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by earnings. Taps, 341; made by Co. for $5. Services, lead and iron; paid for by consumer. Meters: 4; owned by Co. Use of meters optional with Co.; compulsory for large plants. Hydrants, 65. CONSUMPTION.—(Galls.) av., 250,000; max., 550,000; min., 75,000., PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $52,000. Cap. Stock: Authorized, $40,000; all paid-up; paid 6% div'd in '95. No floating or bonded debt. Sinking Fund: $3,500, invested in Trust Co. at 3%. Expenses: Operating, $2,784; taxes, $680. Revenue, $6,812: Consumers, unmetered, $5,288; metered, $329; City, fire protection, $1,140, including street sprinkling; other purposes, $55. MANAGEMENT.—Prest., Dr. N. N. Stokes; Secy. and Treas., Saml. K. Robbins; Supt., Jno. C. Hopkins; Ch. Pump. Engr., Jos. C. Holton. Rept. by Secy., June 16, '96. PROJECTED IMPROVEMENTS.—New boiler and Deane pump, with general improvement of supply. SEWERS.—None.

55. **MORRISTOWN,** Morris Co. (8,156.) Built in 1799 by the Proprietors of the Morris Aqueduct. Additional supplies completed in '93 and '95. Engr., Fred. V. Pitney. FRANCHISE.—Provides for purchase of works by city. SUPPLY.—Chiefly springs, by gravity from impounding to distributing reservoir, supplemented by pumping. PUMPS.—Cap., 1,750,000 galls.; Worthington comp. non-cond., 750,000 and 1,000,000. RESERVOIRS.—Cap., 22,650,000 galls. Distributing, 650,000; four storage, combined, 22,000,000. TANK.—Cap., 140,000 galls.; w. i.; 35 × 20 ft., for high service. DISTRIBUTION.—Mains, 40 miles. Taps, 1,700; made by Co. for $10, including service. Services, lead and galv. i. Meters: 815; owned, controlled and repaired by Co. Co. can compel use of meter and any consumer may have one. Hydrants, public, 111; private, 18. CONSUMPTION.—(Galls.) av., 450,000; max., 600,000; min., 400,000. PRESSURE.—Ordinary, 30 to 55 lbs. Steam fire engines are used. FINANCIAL.—Cost, $351,000. Cap. Stock, $160,000. Floating debt, $14,000, at 5%; bonded, $115,000, at 4%; $50,000, at 6%. MANAGEMENT.—Prest., Henry C. Pitney; Secy. and Treas., P. B. Pierson; Supt., Wm. A.

Dunn. Rept. by F. V. Pitney, July 13. SEWERS.—Has partial system of storm sewers only. REFERENCE.—Eng. News, Mar. 4, '82.

—† **MORRIS TOWNSHIP** (P. O. Morristown), Morris Co. (Outside of city of Morristown, 1,999.) Under construction in '96 by Normandy Heights Water Co. to supply district between Morristown and Madison. Co. was incorp. Apr. 18, '96, with authorized and paid-up cap. stock of $10,000. Prest., Jno. D. Canfield, Morristown. Information from new incorporation returns and Frederic V. Pitney, Morristown; latter, Nov. 30, '96. Press rept., Feb. 27, '97, stated 4 miles mains had been laid and 25 × 80-ft. steel stand-pipe nearly finished; that water would be pumped from reservoir to stand-pipe.

56. **MOUNT HOLLY,** Burlington Co. (Est., 5,690.) Built in '46 by Mount Holly Water Co. Co. is not exempt from local taxes. City to pay $500 per year for fire protection and sewer flushing. SUPPLY.—North Branch of Rancocas Creek, pumping to reservoir and direct. Est. dy. cap. of stream, without storage, 22,900,000 galls. PUMPS.—Cap., 1,500,000 galls.; Worthington comp. cond. dup., 500,000 and 1,000,000. RESERVOIRS.—Two; cap., 1,400,000 galls.; 1,000,000 and 400,000. FISCAL YEAR CLOSED Oct. 5, '95. DISTRIBUTION.—Mains, 9 miles; cost extensions met by construction account. Taps, 750; made by Co. free. Services, lead; paid for by owner. Meters: 9, owned, controlled and repaired by Co. Use of meters optional with Co. Hydrants, 45. CONSUMPTION.—(Galls.) av., 280,000; max., 300,000; min., 215,000. PRESSURE.—Ordinary, 35 to 42 lbs. Steam fire engines are used. FINANCIAL.—Cost, $75,000. Cap. Stock: Authorized, $30,000; all paid-up. Paid 10% div'd in '95. Expenses: Operating, $3,500; int., $500. Revenue: City, fire protection, $250; sewer flushing, $250; other purposes, $25 (fountain). MANAGEMENT.—Prest., B. F. Shrew; Secy. and Supt., H. C. Risdon; Treas., F. B. Lewis; Ch. Pump. Engr., G. Everlin. Rept. by Co., June 12, '96. PROJECTED IMPROVEMENTS.—Laying of larger mains. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, May 6, '82.

57. **NEWARK,** Essex Co. (181,830.) First supplied in 1800 by Newark Aqueduct Co. In '60 city bought these works for $150,000, and in '67-76 built new works. In '92, new gravity supply was introduced from works built under contract by East Jersey Water Co. Engr., Clemens Herschel, 2 Wall St., N. Y. City. Terms of contract are given below under East Jersey Water Co. Newark sells water to the Irvington Water Co. for the village of Irvington and part of Clinton Township; to Belleville Township; and to the West End Land Improvement Association, for the supply of Columbia Heights, in Vailsburg Borough. These three purchasers own and operate their distributing systems, buying water in bulk by meter measurement. In addition, Newark supplies part of Clinton Township, direct, consumers owning mains, but city making service connections and collecting water rents. In the contracts for supplying this outside territory provision is made for the adjustment and purchase by the city of the several distributing systems whenever the respective territory is annexed to the city. SUPPLY.—Impounding reservoirs in drainage area of Pequannock River, by gravity to and from old low and high service distributing reservoirs. Drainage area, 63 sq. miles. Old supply was pumped from driven wells and Passaic River at Belleville. This plant is held in reserve, but has not been used since new supply was introduced; Worthington pumps. PEQUANNOCK RESERVOIRS.—Cap., 9,122,000,000 galls. Oak Ridge: 2,555,000,000; area, 383 acres; drainage area, 21.3 sq. miles; high water, 836 ft. above mean sea level (all drainage areas include water surfaces). Clinton: 3,518,000,000; area, 423 acres; drainage area, 9.6 sq. miles; 992 ft. above mean sea level. Canistear: 2,407,000,000; area, 323 acres; drainage area, 6 sq. miles; 1,086 ft. above mean sea level. Echo Lake: 610,000,000; area, 276 acres; drainage area, 4.2 sq. miles; 892 ft. above mean sea level. Macopin Intake: 32,000,000; area, 12 acres; crest of dam 583.5 ft. above mean sea level. Canistear reservoir is on Pacack Brook, and Oak Ridge is on Pequannock River. Clinton reservoir and Echo Lake are on branches of the river. Echo Brook has been diverted to Lake Macopin. Water from the several reservoirs flows in natural stream channels to Macopin intake, falling 252 ft. in 9 miles from Oak Ridge reservoir; 408 ft. in 7 miles from Clinton; 502 ft. in 15.8 miles from Canistear; and 308 ft. in 22 miles from Echo Lake. Canistear reservoir and Echo Lake were added in '96, former being an artificial reservoir and latter being a natural lake, pondage of which was made available by reconstructing gates at outlet. These two reservoirs have not yet been turned over to city, but probably will be eventually (see East Jersey Water Co., below). SUPPLY MAINS.—Two ⅜ to ¼-in. riveted steel pipes, 21 miles long, one 48 ins. in diam., other 48 ins. for 5.4 miles of upper end, then 42 ins. for 15½ miles. Also 36-in. steel riveted main, made from ¼-in. plates, 5 miles long, from Belleville reservoir to South Orange Ave. high service reservoir. Hydraulic grade of main conduit falls 2 ft. per 1,000, reaching Belleville reservoir at elev. 355.1 ft., or 186.7 ft. above water surface. Hydraulic grade of branch conduit to high service is 300, or 73.4 ft. above water level, it having been the intention of the city when the contract was made to build a special high service reservoir at elev. 300. OLD DISTRIBUTING RESERVOIRS.—Cap., 44,000,000 galls. Belleville receiving: 14,000,000; 168.4 ft. above mean sea level. Low service: 21,000,000; 117 ft. above the sea; South Orange Ave. high service: 9,000,000; 228.6 ft. above the sea. FISCAL YEAR YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 210 miles, besides which water is supplied to 17 miles of mains in suburbs, little if any of which are owned by city; cost extensions met by $20,000 yearly

approp. Taps, 29,646; made by Water Dept. at $14 for ¾-in. and $20 for 1-in. tap, including service pipe. Services, lead; paid for by consumer. Meters: 1,640; owned and repaired by consumer; controlled by dept. Use of meters compulsory for factories and connections 1-in. and larger. City can compel use of meters and any consumer may have one. Hydrants, public, 1,818, not including 134 in suburbs; private, 20. CONSUMPTION.—(Galls.) av., 22,200,000; max., 34,000,000; min., 19,500,000. PRESSURE.—Ordinary, 30 to 35 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,337,490, exclusive of gravity plant, on which $3,500,000 additional has been paid. Bonded debt, $6,450,000, at 4%, due 1922; $260,000, at 7%, due 1905; $782,000, at from 4 to 7%, due 1905-22. Sinking Fund: $508,814, invested in bonds at 4 and 5%. Expenses, $577,776: Operating, $28,421; int., $320,355. Payment to sinking fund $129,000. Revenue: Consumers, unmetered, $411,049; metered, $137,992. MANAGEMENT.—Street and Water Comrs. Chn., Wm. Stainsby; Clerk, Wm. E. Greathead; Engr. and Supt., M. R. Sherrerd; Ch. Pump. Engr., E. C. Butts. Rept. by Supt., July, '96, and (regarding new works) from Clemens Herschel, 2 Wall St., Feb. 4, '94. SEWERS.—Has sanitary and storm sewers. REFERENCES.—General: Eng. News, May, 7, '81, Mar. 15, Aug. 9, 23, Sept. 6, Oct. 11, 18, '79, June 15, '93; steel pipes, July 13, '93, Dec. 19, '95, Jan. 23, '96; improvements, Aug. 1, '91; reservoirs, June 21, '90, June 15, '93; Passaic R. drainage area, Oct. 11, '90; Pequannock R. supply, July 6, '93.

EAST JERSEY WATER CO.

NEWARK CONTRACT.—Sept. 24, '89, this Co. (Lehigh Valley R. R. Co., guarantor) contracted with city of Newark to secure water rights, build reservoirs and pipe line of sufficient capacity to furnish city with gravity supply of 50,000,000 galls. per day, delivered at Belleville receiving reservoir, with branch main capable of delivering 25,000,000 galls. per day at South Orange Ave. high service reservoir, latter under head equivalent to 300 ft. elev. above tide. City agreed to buy water for 25 yrs. or to purchase works from Co. Price per 1,000,000 galls. was to be $39 up to 20,000,000 per day, then diminishing by 50 cts. until price reached $36. City elected to buy works, which it did at contract price of $6,000,000. In consideration of right to use 22,500,000 galls. per day until Sept. 24, 1900, Co. agreed to allow city to retain $2,000,000 of contract price until 1900. City has paid $3,500,000, retaining $500,000 on account of questions which have arisen regarding fulfillment of contract. In '96, it was determined that the 48-in. pipe line had dy. capacity of only about 37,000,000 galls., and the 36-in., of 22,500,000 galls., instead of 50,000,000 and 25,000,000 galls., respectively. Supplementary contract was made between Co. and Newark, by which latter agreed to accept the smaller mains and pay Co. $10,000, Co. agreeing to parallel the 48-in. main with a 48 and 42-in. pipe, instead of merely laying a pipe large enough to make up the deficiency of 13,000,000 galls. Under the contract between Co. and city Newark may sell Pequannock water inside its present or future limits and to territory comprised in townships of Belleville, Clinton, East Orange and South Orange. City cannot sell water to municipalities outside this limit and Co. cannot sell water within it. After Sept. 24, 1900, all water from Penquannock drainage area becomes property of Newark. See above for description of works as built. JERSEY CITY CONTRACT.—In '96 Co. began a partial and temporary supply to Jersey City, delivering balance or remnant of Pequannock water, not then already sold, through 42-in. Venturi meter and about 10,000 ft. of 42-in. steel pipe, laid by it between the Belleville reservoirs of Newark and Jersey City. This included the crossing of the Passaic River, which was effected by 7 16-in. submerged cast-iron pipes. Contract provides that city shall pay $43 per 1,000,000 galls. up to 20,000,000 galls. per day, then on a sliding scale down to $22 per 1,000,000 galls, when 50,000,000 galls. are delivered. MONTCLAIR CONTRACT.—Co. delivers water to the Montclair water Co. through a 16-in. Venturi meter at Brookdale from its original 48-in. pipe line. This water supplies several municipalities. See Montclair. FRANKLIN CONTRACT.—Franklin Township (Nutley is the principal village) buys water from Co. through meter at pipe line. KEARNEY CONTRACT.—Co. has contract to deliver water to Kearney through 16-in. Venturi meter near Jersey City reservoir, but this has not gone into effect. The Pequannock water is being furnished, however, by Jersey City. BAYONNE CONTRACT.—Co. delivers water to New York & New Jersey Water Co., through 30-in. Venturi meter, at the Jersey City reservoir, for supply of Bayonne, which see. MANAGEMENT.—Prest., E. P. Wilbur; V.-Prest., Henry S. Drinker; Secy., D. G. Baird; Treas., Jas. A. Garland; Comptroller, E. Le B. Gardiner; Engr. and Supt., Clemens Herschel. Offices of Co. are at 2 Wall St., N. Y. City. Rept. by Ch. Engr., Feb. 4, '97. REFERENCES.—See above.

59. **NEW BARBADOES**, Bergen Co. Coextensive with Hackensack, which see.

58. **NEW BRUNSWICK**, Middlesex Co. (18,603.) Owned by city since '73. Built in '65-8 by Brunswick Water Co. SUPPLY.—Lawrence Brook, pumping to reservoir. Drainage area, 43 sq. miles; est. dy. yield based on lowest monthly flow, 5,500,000 galls. PUMPS.—Cap., 7,000,000 galls.; 2—3,000,000 Worthington; dup. water power and comp. cond. Other not given. Av. cost of coal, $3.55 per short ton. RESERVOIR.—Cap., 15,000,000 galls.; distributing; 130 ft. above pumps. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 35 miles; cost extensions met by earnings. Taps, 2,845; made by city. Services, lead and galv. i.; paid for by owner. Meters: 160; owned and con-

trolled by city. Use of meters optional with city; compulsory for factories, livery stables, hotels and flats. Hydrants, public, 213; private, 12. CONSUMPTION.—(Galls.) av., 1,600,000; max., 2,000,000; min., 1,400,000. PRESSURE.—Ordinary, 18 to 55 lbs. Steam fire engines are used. FINANCIAL.—Cost, $547,944. Bonded debt (in '90), $440,000: $121,500 at 6%, $318,500 at 7%; latter refunded at 6% as fast as they fall due. Expenses, $12,779. Revenue, $54,593: Consumers, unmetered, $30,050; metered, $14,113; City, fire protection, $10,430. MANAGEMENT.—Chn., Jas. Deshler; Secy., Jno. W. Welsh; Treas. and Supt., F. A. Hoffman; Ch. Pump. Engr., Robt. Thomas. Rept. by Supt., Nov. 11. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 25, '82.

59. **NEWTON,** Sussex Co. (3,003.) Built in '95 by town; put in operation Sept. 1. Engr., Louis L. Tribus, 84 Warren St., N. Y. City. Contrs., Smith & McCormick, Easton, Pa. SUPPLY.—Morris Lake, by gravity. Area of lake, 136 acres; drainage area, 1½ sq. miles, which can be doubled if desired. Cap., 730,000,000 galls. Supply main, 12 and 10-in., 8 miles long. DISTRIBUTION.—Mains, 8 miles, including supply main, as is always done in this volume when figures are given separately. Taps, 300; made by town for $6, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters: 39; owned, controlled and repaired by town; yearly rental, 10%. Use of meters compulsory for factories, liveries, hotels, motors and florists. Town can compel use of meters and any consumer may have one. Hydrants, public, 80. PRESSURE.—75 to 150 lbs., according to elev. FINANCIAL.—Cost, $105,000. Bonded debt, $40,000, at 4%; due $10,000 in every 5 yrs., beginning with 1910. Expenses, $5,240: Operating, $1,000; int., $4,240. Revenue, $6,150: Consumers, unmetered, $2,500; metered, $1,500; City, fire protection, $2,000; street sprinkling, $150. MANAGEMENT.—Prest., Andrew J. Van Blarcom; Secy., A. Craig; Treas., Lewis S. Iliff. Rept. by M. E. Craig, Clerk, July 24. SEWERS.—None.

39. **NORTH BERGEN,** Hudson Co. (5,715, town.) Supply from Hoboken.

69. **NORTH PLAINFIELD,** Union Co. See Plainfield.

60. **NUTLEY,** Essex Co. (Franklin Township, 2,007.) Bought by Township of Franklin, Oct. 1, '95, for about $47,000. Built in '89 by Nutley Water Co. SUPPLY.—East Jersey Water Co.'s mains (see Newark); also from springs, pumping direct. PUMPS.—Cap., 500,000 galls.; Worthington dup. water power. DISTRIBUTION.—Mains, not given; cost extensions met by bond issues. Taps, 180; made by town for $20. Services paid for by consumer. Meters, 0. Town can compel use of meters. Hydrants, not given. CONSUMPTION.—(Galls.) av., 50,000. FINANCIAL.—Cost, $47,265. Bonded debt, $47,000, at 4%; due 1925. Revenue: City, fire protection, $1,000. MANAGEMENT.—Chn., A. Blum; Clk., Stephen P. Vreeland; Treas., Max. Kaufmann. Rept. by Treas., June 6. PROJECTED IMPROVEMENTS.—Bonds issued for extensions. SEWERS.—None.

61. **OCEAN CITY,** Cape May Co. (452.) Built by Ocean City Water Co. FRANCHISE.—Perpetual. Meter rates are regulated by city. Co. is not exempt from local taxes, but receives compensation for public services. No legal difficulties. SUPPLY.—Artesian wells, 800 ft. deep, pumping to stand-pipe. PUMP.—Gaskill. STAND-PIPE.—Cap., 50,000 galls.; 26 × 75 ft. high. DISTRIBUTION.—Hydrants, 30. PRESSURE.—Ordinary, 35 lbs.; fire, 115 lbs. FINANCIAL.—Cap. Stock, authorized, $50,000; all paid-up. MANAGEMENT.—Prest., E. B. Lake; Secy., Harry G. Steelman; Treas., G. E. Palen; Supt., H. M. Kalbeck. Rept. by Prest., June 30. SEWERS.—Has sanitary sewers only.

62. **OCEAN GROVE,** Monmouth Co. (2,754.) Built in '84 by Ocean Grove Ass'n. SUPPLY.—Artesian wells, av. depth 450 ft., pumping to tank. PUMPS.—Cap., 900,000 galls.; Giles (or Guild) & Garrison. TANK.—Cap., 215,000 galls.; iron, 35 × 30 ft. FISCAL YEAR CLOSED Sept. 30. DISTRIBUTION.—Mains, 13½ miles. Taps, 864. Meters: Not given. Hydrants, 41. CONSUMPTION.—(Galls.) av., 186,300. FINANCIAL.—Cost, $58,713. Expenses, $1,731. Revenue, $8,159. SEWERS.—Has sewers. NOTE.—No report since '90-1 Manual. REFERENCE.—Pohle air lift and driven wells, Jan. 9, '96, illus.

63 **ORANGE,** Essex Co. (18,844.) Built in '83 by city. SUPPLY.—West Branch of Rahway River, by gravity from impounding reservoir; also pumping for high service. Drainage area, 5 sq. miles. PUMP.—Cap., 400,000 galls.; Worthington non-comp. high service. RESERVOIR.—Cap., 375,000,000 galls.; area about 60 acres; about 350 ft. above, and 5 miles from center of city. FISCAL YEAR CLOSED Feb. 28. DISTRIBUTION.—Mains, 28 miles. Taps, 1,933. Services, lead and galv. i. Meters: 306. Hydrants, 210. FINANCIAL.—Bonded debt, $420,000, at 5%. Sinking Fund: $47,450. Expenses: Operating and int., $27,289. Revenue: Consumers, $33,819. NOTE.—No report since '90-1 Manual, except regarding high service. REFERENCE.—Eng. News, Jan. 26, '84.

39. **PALISADES,** Bergen Co. (2,590, town.) Supply from Hoboken.

73. **PALMYRA,** Burlington Co. (Est., 820.) Supply from Riverton.

64. **PASSAIC,** Passaic Co. (13,028.) Built in '72 by Aquackanonk Water Co. SUPPLY.—Reservoir of Passaic Water Co., at Paterson, pumping to reservoir; formerly Vreeland Lake, by gravity, supplemented by Passaic River. Pumping machinery remains in case of need. PUMPS.—Cap. (in '89), 2,500,000 galls.; 500,000 Carr water power; 2,000,000 Worthington comp. (A 3,000,000 Worthington non-comp. high pressure rept. by maker in '96.) RESERVOIR.—Cap., 1,000,000 galls.; 125 ft. above river. DISTRIBUTION.—Mains, 20 miles. Taps, 700. Meters, 0. Hydrants, 162. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—(In '89) Ordinary, 35 lbs.; fire, 55 lbs. FINANCIAL.—

Press rept., Apr., '96, stated Co. had just mortgaged its plant to secure $300,000 of 5% bonds, due in Jan., 1939. Revenue: City, $7,290. MANAGEMENT.—Prest., Garrett A. Hobart, Paterson; Supt., W. Paulison. SEWERS.—Has sanitary sewers. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, June 10, '82.

65. **PATERSON,** Passaic Co. (78,347.) Built in '56 by Passaic Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Passaic River, above Passaic Falls, pumping to reservoirs. Drainage area, 797 sq. miles. PUMPS.—Cap., 18,000,000 galls. (Makers rept. 2—6,000,000 comp. non-cond. and 1—3,000,000 non-comp. high pressure, in '96. Early repts. from Co. gave 15,000,000 water power and 3,000,000 steam.) RESERVOIRS.—Cap., 50,000,000 galls. Four, on different levels. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 70 miles. Taps, 6,648. Meters, 2. Hydrants, 834. CONSUMPTION.—(Galls.) av., 10,000,000. FINANCIAL.—Withheld. MANAGEMENT.—Prest., G. A. Hobart; Secy., J. C. Ryle; Treas., E. T. Bell; Supt., Wm. Ryle. PROJECTED IMPROVEMENTS.—3—5,000,000 Holly Gaskill hor. high duty pumps were being erected for high service at close of '96. SEWERS.—Has sanitary sewers. NOTE.—No report since '90-1 Manual except as to management. REFERENCE.—Eng. News, Nov. 12, '81.

66. **PEMBERTON,** Burlington Co. (834.) Built in '94 by Co.; put in operation in Oct. In June, '94, Pemberton Township Water Co. was incorp.; and in Apr., '96, Pemberton Township Water, Sewerage & Light Co. was incorp.; latter apparently a reorganisation of former. SUPPLY.—Pumping to tank. TANK.—Cap., 60,000 galls.; cedar. FINANCIAL.—Cap. Stock (last-named Co.): Authorized, $25,000; paid-up, $8,000. MANAGEMENT.—Incorporators: Theo. Budd, Wm. H. Bishop and others, all of Pemberton. NOTE.—Above information from new incorporation and press repts.

D 4. **PENNINGTON,** Mercer Co. (Est., 900.) Built in '86-8 by Pennington Spring Water Co., under perpetual franchise. Supply, spring, by gravity. Mains, 3½ miles. Taps, 60. Cost, $8,000. No rept. since '90-1 Manual.

67. **PERTH AMBOY,** Middlesex Co. (9,512.) Now owned by city. Built in '82 by Perth Amboy Water Co. In '92-3 city built works and in '94 it bought the Co.'s plant for (press rept.) $31,000. SUPPLY.—Tennent's Brook, pumping from impounding reservoir to stand-pipe. Drainage area, about 10 sq. miles. PUMPS.—Cap., 5,500,000 galls.; Loretz 4,000,000; Blake 1,500,000. Anthracite pea coal used; av. cost, $2.60 per short ton. RESERVOIR.—Cap., 108,000,000 galls. STAND-PIPE.—Cap., 167,000 galls.; iron, 20 × 71 ft. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 18 miles; cost extensions met by bonds. Taps, 835; made by city for $2.50. Services, iron, with lead connection; paid for by consumer. Meters: 40; owned by consumer; controlled and repaired by city. Use of meters compulsory for factories. City can compel use of meters and any consumer may have one. Hydrants, 157. CONSUMPTION.—(Galls.) av., 2,000,000; max., 2,400,000; min., 1,800,000. PRESSURE.—Ordinary, 40 lbs.; fire, 50 lbs. FINANCIAL.—Cost, $280,000. Bonded debt, $250,000, at 4½%; $12,000 at 4½%; $18,000 at 5%. Expenses, $25,868: Operating, $13,218; int., $12,150. Revenue, $23,015: Consumers, unmetered, $8,250; metered, $9,765; City, fire protection, $5,000. MANAGEMENT.—Supt., Geo. W. Eggert; Ch. Pump. Engr., O. A. Burns. Rept. by Supt., Oct. 22, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 1, '83.

68. **PHILLIPSBURG,** Warren Co. (8,644.) Built in '87 by People's Water Co. Lehigh Water Co., Easton, Pa., supplies part of town. FRANCHISE.—Does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes and receives no compensation for public service. No legal difficulties. SUPPLY.—Spring, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; Gordon & Maxwell. RESERVOIRS.—Cap., 2,000,000 galls.; distributing. DISTRIBUTION.—Mains, 13 miles. Taps made by Co. for $2 and $3. Services, w. i.; paid for by property owner. Meters, not given; controlled and repaired by Co. Use of meters compulsory by railroads. Hydrants, public, 70; private, 6. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 112 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $100,000. MANAGEMENT.—Prest., S. Thomas; Secy., J. O. Carpenter; Treas., J. A. Buchman; Supt., G. G. Stryker. Rept. by Supt., June 6. SEWERS.—Has sewers.

69. **PLAINFIELD,** Union Co. (11,267.) Built in '91 by Plainfield Water Supply Co. under legislative charter granted about '69. Supplies Union Water Co. (see Elizabeth) and borough of North Plainfield. FRANCHISE.—Plainfield to pay $15 per hydrant per annum and 10 cents per 1,000 galls. for sewer flushing; contract extends to 1904. Press rept. in '91 stated that North Plainfield had contracted for 75 hydrants at $1,050 per yr. SUPPLY.—Twenty-four driven wells, pumping to stand-pipe. PUMPS.—Cap., 5,000,000 galls.; Worthington comp. cond., 2,000,000 and 3,000,000. Rice coal used; av. cost, $1.65 per short ton. STAND-PIPE.—Cap., 515,000 galls.; iron, 25 × 140 ft. FISCAL YEAR CLOSED Nov., '95. DISTRIBUTION.—Mains, 45 miles; cost extensions met by cash. Taps, 1,300; made by Co. for $10. Services, lead and i.; paid for by consumer. Meters: 25; owned by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, 325; 79 are in North Plainfield. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—Ordinary and fire, 74 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Frank Bergen, Elizabeth; Secy. and Treas., E. R. Pope; Supt., Amos Andrew. Rept. by Co. SEWERS.—Has sanitary and partial storm sewers. REFER-

ENCE.—Driven wells, Feb. 22, '94. NOTE.—In Dec., '96, New Jersey Water Co. was incorp., with authorized cap. stock of $2,000,000, $5,000 paid-up, by Jas. Clark, Plainfield; Jno. C. Rodgers and Edw. J. Farrell, both of New York. Object of Co. said to be to supply water in Plainfield.

70. **PRINCETON,** Mercer Co. (3,422.) Built in '83 by Princeton Water Co. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $30 per hydrant per annum. No legal difficulties. SUPPLY.—Well, pumping to elevated tank. PUMPS.—Cap., 1,000,000 galls.; Worthen 500,000; Worthington 500,000 comp. non-cond. Force main (in '89), 10-in., 6,000 ft. long. TANK.—Cap., 146,000 galls.; iron, 20 × 60 ft., on iron trestle 60 ft. high. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, about 7 miles; cost extensions met by income on loans. Taps, 413; made by Co. for $8. Services, galv. i.; paid for by consumer. Meters: 413; owned and controlled by Co.; repairs paid by consumer. Use of meters compulsory for all consumers. Hydrants, 54. CONSUMPTION.—(Galls.) av., 75,000; max., 125,000; min., 60,000. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock, Authorized, $50,000; all paid-up. Bonded debt, $20,000, at 5%; due 1907. Sinking Fund: $10,000, invested at 3%. Expenses, $8,700: Operating, $7,500; int., $1,200. Revenue: City, fire protection, $1,300; street sprinkling, $400. No deficits. MANAGEMENT.—Prest., Chas. E. Green, Trenton; Secy. and Treas., Wm. Libbey; Supt., Jas. E. Burke. Rept. by Secy., July 14. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 1, '83, illus.

71. **RAHWAY,** Union Co. (7,105.) Built in '71-2 by city. SUPPLY.—Rahway River, pumping direct. Est. min. dy. flow of river, 5,297,000 galls. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. DISTRIBUTION.—Mains, 13 miles. Taps, 596. Meters, 1. Hydrants, 125. CONSUMPTION.—(Galls.) av., 690,000. FINANCIAL.—Bonded debt, $185,000, at 7%, due '91. Expenses, $19,467. Revenue, $11,483. SEWERS.—Has sewers. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, Oct. 15, '81.

77. **RARITAN,** Somerset Co. (2,556.) Supply from Somerville.

72. **RED BANK,** Monmouth Co. (4,145.) Built in '85 by village. SUPPLY.—Three artesian and some dug wells, pumping to reservoir. In '89 there was a 15 × 60-ft. well. PUMPS.—Cap., 1,200,000 galls.; two Worthington vert. comp. dup. special; pump ends in well. Anthracite pea coal used; av. cost, $2.80 per short ton. RESERVOIR.—Cap., 850,000 galls.; 169 ft. above bottom of well, 140 ft. above tide, 110 ft. above main level of town. DISTRIBUTION.—Mains, 10 miles. Taps, 425; made by town for $6, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 200; owned by consumer; yearly rental, 20% of cost. Town can compel use of meters and any consumer may have one. Hydrants, 100. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $85,000. Bonded debt, $60,000, at 5%, due 1904; $25,000, at 4%, due 1910. Expenses, Operating, $3,300. MANAGEMENT.—Three Comrs. Chn., Wm. Cullington; Secy., Wm. S. Sneden; Treas., J. S. Applegate; Ch. Pump. Engr., W. J. Bentley. Rept. by Secy., June 19. SEWERS.—Sanitary sewers have been partly contracted for. REFERENCE.—Eng. News, Aug. 29, '85, illus.

39. **RIDGEFIELD,** Bergen Co. (5,477.) Supply from Hoboken.

39. **RIDGEFIELD PARK,** Bergen Co. Supply from Hoboken.

39. **RIVERSIDE,** Bergen Co. Supply from Hoboken.

73. **RIVERTON AND PALMYRA,** Burlington Co. (Est., Riverton, 700; Palmyra, 1,000.) Built in '89 by Riverton & Palmyra Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Infiltration well, near Delaware River, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Barr dup. TANK.—Cap., 70,000 galls. DISTRIBUTION.—Mains, 9 miles. Taps, 165. Meters, 0. Hydrants, 53. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $50,000; all paid-up. No debt. Expenses, Operating, $1,600. Revenue, City, $530. NOTE.—No report since '90-1 Manual.

P S. **ROCKAWAY,** Morris Co. (6,033, township.) Dec., '96, contract for works was awarded by city to Stewart M. Neff, Dover. Supply, White Meadow Brook, by gravity. There will be a 1,000,000-gall. reservoir, 5 miles mains and 45 hydrants. Est. cost, $25,000. Bids were to be received Jan. 1, '97, for $25,000 4% 10 to 40-yr. bonds. Mayor, Morford B. Strait.

26. **ROSELLE,** Union Co. See Union Water Co., Elizabeth.

39. **RUTHERFORD,** Bergen Co. (2,293.) Supply from Hoboken.

74. **SALEM,** Salem Co. (5,516.) Built in '82 by city. SUPPLY.—Originally from well and impounding reservoir on Laurel River, direct pumping; supplemented in '94 with 10 artesian wells, 250 to 270 ft. deep. Drainage area of stream, 5 sq. miles. Conduit to pump well (in '89), 12-in. c. i., 4 miles long. PUMP.—Cap., 1,500,000 galls.; Holly quadruplex. Anthracite pea and dust coal used; av. cost, $1.75 per short ton. RESERVOIR.—Cap., 42,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10½ miles; cost extensions met by taxation. Taps made by consumer for $1.25. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 71. CONSUMPTION.—(Gals.) av., 400,000. PRESSURE.—Ordinary, 35 lbs.; fire, 75 to 100 lbs.

One steam fire engine is owned, but not used. FINANCIAL.—Cost, $100,000. Bonded debt, $5,000, at 5%, due '96; $20,000, at 5%, due 1901; $20,000, at 5%, due 1906; $3,000, at 5%, due 1904. Expenses, $5,792: Operating, $3,123; int., $2,669. Receipts pay all expenses except retiring bonds. MANAGEMENT.—Rept. by Supt., C. W. Casper, June 17. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Dec. 28, '82.

39. **SCHRAALENBURG**, Bergen Co. (Est., 207.) Supply from Hoboken.

46. **SEABRIGHT**, Monmouth Co. (Est., 1,000 in winter and 3,000 in summer.) Supply from Long Branch.

75. **SEA ISLE CITY**, Cape May Co. (766.) Built in '96 by Sea Isle City Water Co.; put in operation June 1. Engr., William H. Boardman; Contr., John B. Foley, both of Philadelphia, Pa. FRANCHISE.—25 yrs. from 1896; provides for purchase of works by city at any time. Rates are subject to regulation by city council. No legal difficulties. SUPPLY.—Artesian well, 854 ft. deep. PUMPS.—Cap., 400,000 galls.; Deane, 8 × 8 triplex, driven by 20-HP. Otto gasoline engine. STAND-PIPE.—Cap., 58,760 galls.; 10 × 100 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 105; made by Co., free. Services, lead and galv. i.; paid for by Co. to curb line. Meters, 0; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 40. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Geo. Pfeiffer, Jr., Camden; Treas., Selden Twitchell, Philadelphia, Pa.; Ch. Pump. Engr., Jerry Delaney. Rept. by Wm. H. Boardman, 2320 Tulip St., Philadelphia, Pa., Aug. 12.

76. **SHORT HILLS**, Essex Co. (Est., 400.) Built in '80 by Stewart Hartshorn. Supplies part of Milburn and Springfield townships. SUPPLY.—Springs and artesian wells, pumping to reservoir. Wells are 200 to 250 ft. deep. PUMP.—Cap., 1,200,000 galls.; Worthington: 1,000,000 simple high pressure and 200,000. (Rept. by makers in '96.) Scranton anthracite pea coal used. RESERVOIRS.—Cap., 4,000,000 galls. DISTRIBUTION.—Hydrants, 20. PRESSURE.—Ordinary, 60 to 125 lbs. FINANCIAL.—Cost (in '90), $72,000. No debt. MANAGEMENT.—Owner, Stewart Hartshorn. Rept. by Supt., E. E. Layng. SEWERS.—Has sewers.

77. **SOMERVILLE AND RARITAN**, Somerset Co. (Somerville, 3,861; Raritan, 2,556.) Built in '83 by Somerville Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $28 per hydrant per year; $11 per year for each flush-tank. No legal difficulties. SUPPLY.—Raritan River, pumping to stand-pipe and direct. Est. dry weather flow of river, 42,330,000 galls. PUMPS.—Cap., 2,000,000 galls.; 1,000,000 Smith-Vaile power pump and 1,000,000 steam, make not given. Anthracite pea coal used. FILTERS.—Cap., 2,000,000 galls.; Hyatt (or New York) and New York. STAND-PIPE.—Cap., 514,000 galls.; iron, 25 × 140 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by income, increase of capital or borrowing. Taps, 600; made by Co. for $10, including service. Services, lead; paid for by Co. Meters, 8; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for steam users. Hydrants, 62. CONSUMPTION.—(Galls.) av., 750,000; max., 1,082,000; min., 600,000. PRESSURE.—Ordinary, 45 lbs.; fire, 75 lbs. One steam fire engine is used. FINANCIAL.—Cost, $118,319. Cap. Stock: Authorized, $100,000; all paid-up; paid 6% div'd in '95. Floating debt, $8,300, at 5%. No bonded debt. Expenses, $5,920: Operating, $4,731; int., $279; taxes, $910. Revenue, $14,685: Consumers, unmetered, $10,362; metered, $2,395; City, fire protection, $1,400; street sprinkling, $360; sewer flushing, $168. All surplus is invested in extensions. MANAGEMENT.—Prest., Adolph Mack, Raritan; Secy., Wm. H. Taylor; Treas., H. K. Gaston; Supt., J. H. Smith; Ch. Pump. Engr., E. Slack. Rept. by Treas., June 11. SEWERS.—Has sanitary and some storm sewers. REFERENCE.—Eng. News, Aug. 5, '82.

78. **SOUTH AMBOY**, Middlesex Co. (4,330.) Put in operation in Jan., '94, by borough. SUPPLY.—Perth Amboy works, through 12-in. main; two 6-in meters. DISTRIBUTION.—Mains, about 7 miles. MANAGEMENT.—Comr., Stephen Martin.

79. **SOUTH ORANGE**, Essex Co. (3,106.) Built in '90 by village; put in operation Jan. 29. SUPPLY.—Commonwealth Water Co.'s plant (Summit), through meters; 10 cts. per 1,000 galls. RESERVOIR.—See Summit. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 16 miles, of which 3.87 miles are owned privately. Taps, 446; made by village for $15, including service. Services, lead; paid for by owner. Meters, 362; 210 owned by village and 152 by consumers; controlled and repaired by village; yearly rental, $2. Use of meters optional with village; compulsory for all but those with one plain faucet, and these also may have one. Hydrants, 99. CONSUMPTION.—(Galls.) av., 130,054; max., 169,961; min., 103,100. PRESSURE.—Ordinary, 120 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $48,000. Bonded debt, $46,000, at 5%. Expenses, $9,000: Operating, $6,700; int., $2,300. Revenue, $7,541: Consumers, unmetered, $849; metered, $6,692. Interest on bonds is required to be raised by general taxation. No deficit has occurred. MANAGEMENT.—Rept. by Supt., Chas. J. Barrett, July 13. SEWERS.—None.

80. **STOCKTON TOWNSHIP** (P. O. Camden), Camden Co. (6,445.) Built in '92 by Stockton Water Co.; put in operation in Sept. Engr., I. S. Cassin, 1404 N. 12th St.; Contr., John B. Foley, both of Philadelphia, Pa. No legal difficulties. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 1,850,000 galls.; Deane, 850,000 comp. dup., and Barr, 1,000,000. STAND-PIPE.—Cap., 115,200 galls.; 14 × 100 ft. FIS-

CAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 28½ miles; cost extensions met by Co. Taps made by Co. Services, lead and galv. 1. Meters, 0. Hydrants, 140. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Geo. Pfeiffer, Jr., Camden, N. J.; Secy., Chas. S. King, Camden, N. J.; Treas., Selden Twitchell, Philadelphia; Ch. Pump. Engr., Walter Claypool. Rept. by Wm. H. Boardman, 2320 Tulip St., Philadelphia, Pa., Sept. 26. SEWERS.—None.

81. **SUMMIT,** Union Co. (3,502.) Controlled by Commonwealth Water Co. Built in '89 by Summit Water Co. Sells water through meter to South Orange. City to pay $50 per hydrant per yr. SUPPLY.—Wells, pumping to stand-pipe and reservoir. PUMPS.—Cap., 2,000,000 galls.; 1,000,000 Worthington and 1,000,000 Snow. Anthracite pea coal used; av. cost, $3.15 per short ton. RESERVOIR.—Cap., not given. 65 × 25 ft., ×15 ft. deep. Supplies So. Orange. STAND-PIPE.—Cap., 238,600 galls.; iron, 25 × 65 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 28 miles; cost extensions met by income. Taps, 700; made by Co., free. Services, lead and galv. 1.; paid for by consumer. Use of meters compulsory for all large consumers. Co. can compel use of meter and any consumer may have one. Hydrants, public, 80; private, 9. CONSUMPTION.—(Galls.) av., 500,000; max., 750,000; min., 400,000. PRESSURE.—Ordinary, 50 to 80 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000; paid-up, $60,000. Bonded debt, $60,000, at 5%. Expenses: Int., $3,000; taxes, $350. Revenue, City, $2,550. MANAGEMENT.—Prest., Fred R. Drake, Easton, Pa.; Secy. and Treas., C. Ph. Bassett; Supt., Fred Green; Ch. Pump. Engr., Jno. Capel. SEWERS.—Has sanitary sewers. NOTE.—No report as to financial since '90-1 Manual.

89. **TENAFLY,** Bergen Co. (Est., 1,200.) Supply from Hoboken.

82. **TRENTON,** Mercer Co. (57,458.) Bought and rebuilt by city in '55; built in 1803 by Co. for domestic works. In '88 Chambersburgh borough consolidated with Trenton; latter assumed borough works and $45,000 bonds. SUPPLY.—Delaware River, pumping to reservoir and high service tank. Drainage area, 6,916 sq. miles. PUMPS.—Cap., 16,000,000 galls.; Allis vert. triple exp., 10,000,000; Worthington comp. cond., 6,000,000. Anthracite coal used. RESERVOIRS.—Cap., 27,000,000 galls. Distributing. TANK.—Cap., 1,150,000 galls.; steel, 70 × 40 ft. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 110 miles; cost extensions met by income. Taps made by city for $1.50. Services, galv. 1.; paid for by owner. Meters, 150; owned mostly and controlled and repaired by city. Use of meters optional with city; compulsory for factories, hotels, etc. Hydrants, 471. CONSUMPTION.—(Galls.) av., 5,500,000. PRESSURE.—Ordinary, 22 to 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $956,576. Bonded debt, $123,000: $75,000, at 4%, due 1913; $43,000, at 5%, due 1905-8; $5,000, at 5%, due 1898. Sinking Fund, $25,190, invested at 4%. Expenses, $46,188: Operating, $35,988; int., $10,200. Revenue: Consumers, unmetered, $33,429; metered, $16,713. MANAGEMENT.—Prest., Chas. H. Skirm; Secy. and Treas., Chas. A. Reid; Supt., Wm. J. Bowers; Ch. Pump. Engr., Geo. W. Lenox. Rept. by Secy., June 5. PROJECTED IMPROVEMENTS.—Contract for 100,000,000-gall. reservoir let in Nov., '96, to Louis Lawton, Trenton, for $349,489; Engr., Chas. A. Hague, 39 Cortlandt St., N. Y. City. SEWERS.—Has sanitary and storm sewers.—REFERENCES.—Eng. News, Aug. 19, '82; tests of pumps, May 10, '94, Dec. 13, '94, illus.

39. **UNION,** Hudson Co. (10,643.) Supply from Hoboken. REFERENCE.—Eng. News, May 9, '85.

39. **UNION TOWNSHIP,** Hudson Co. (2,127.) Supply from Hoboken.

83. **VAILSBURG,** Essex Co. (Not given.) Part of borough known as Columbia Heights is supplied by water from Newark works through 1½ miles of mains and 11 hydrants. NOTE.—Feb. 5, '96, Eugene McMurray, Newark, rept. that contract had been signed by which South Orange agreed to furnish water to Suburban Land Improvement Co., of Newark, for the upper section of Vailsburg; also that Mr. Murray had been engaged to prepare plans and estimates for two miles of mains.

84. **VINCENTOWN,** Burlington Co. (Est., 722.) Built in '96 by Vincentown Water Co.; put in operation Oct. 1. Engr., E. A. Alcott, Mt. Holly. No legal difficulties. SUPPLY.—South branch of Rancocas Creek, pumping to stand-pipe. Est. dy. cap. of creek, without storage, 9,000,000 galls. PUMPS.—Cap., 400,000 galls.; Deming trip., driven by 18-HP. Otto gas engine. STAND-PIPE.—Cap., 84,600 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 110. Services, lead and galv. 1.; paid for by Co. to curb for original subscribers. Hydrants, 20. PRESSURE.—Ordinary, 40 to 65 lbs.; fire, 90 to 110 lbs. FINANCIAL.—Cap. Stock, $7,000; stock issued in 700 shares at $10 each; all paid-up. Bonded debt, $2,500, at 5%, due 1906. MANAGEMENT.—Prest., F. S. Hilliard; Secy., H. K. Colkitt; Treas., Saml. O. Ross. Rept. by Jno. A. Kinney, Nov. 9. SEWERS.—None.

85. **VINELAND,** Cumberland Co. (3,822.) Now operated by Vineland Water-Works Co. Built in '86 by C. J. Keighley, who incorp. Co. in '91. FRANCHISE.—Provides for purchase of works by city; price to be cost of construction and 6% interest from first date of construction. Rates not subject to regulation by city. SUPPLY.—Driven wells, pumping to tank. PUMPS.—Cap., 200,000 galls.; Gaskill. TANK.—Cap., 79,000 galls.; 30 × 15 ft. DISTRIBUTION.—Mains, 12 miles. Taps, 83. Services, galv. 1. Meters, 3. Hydrants, 30. CONSUMPTION.—(Galls.) av., 125,000. FINANCIAL.—Cap. Stock: Authorized, $75,000. No debt. Revenue, $514. NOTE.—No report since '90-1 Manual.

89. **WALLINGTON,** Bergen Co. Supply from Hoboken.

86. **WASHINGTON,** Warren Co. (2,884.) Built in '82 by Washington Water Co. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Stream, by gravity. RESERVOIRS.—Cap., 1,000,000 galls. Storage. DISTRIBUTION.—Mains not given; cost extensions met by income. Taps, 450; made by Co. for $1.50. Services, iron; paid for by consumer. Meters, 1; owned by Co. Use of meters compulsory for R. R. Co. Hydrants, 30. PRESSURE.—Ordinary, 60 lbs. One steam fire engine is used. FINANCIAL.—Cost, $35,000. Cap. Stock: Authorized, $30,000; all paid-up; paid 12% div'd in '95. Expenses, Operating, $500. Revenue, City, fire protection, $800. MANAGEMENT.—Prest., J. W. Fitts; Secy., D. Vliet; Treas., P. H. Hann. Rept. by Supt., J. E. Fulper, July 18. SEWERS.—None.

39. **WEEHAWKEN,** Hudson Co. (1,943.) Supply from Hoboken. REFERENCE.—Eng. News, Nov. 6, '86.

67. **WENONAH,** Gloucester Co. (Est., 500.) Built in '85 by Wenonah Water Co. FRANCHISE.—Provides for purchase of works by city. Rates are not subject to regulation by city. SUPPLY.—Spring, pumping to tank and direct. PUMPS.—Cap., 300,000 galls.; Worthington water-power, with engine in reserve. TANK.—Cap., 59,000 galls.; wood. FISCAL YEAR CLOSED Dec. 31. FINANCIAL.—Cap. Stock: Authorized, $25,000; paid-up, $12,500; paid 5% div'd in '90. No debt. MANAGEMENT.—Prest., Stephen Greene; Secy., E. L. Farr; Supt., Blair Smith. NOTE.—No rept. since '90-1 Manual.

88. **WEST ASBURY PARK** (P. O., Asbury Park), Monmouth Co. (Neptune township, 8,333.) Under construction in '96-7 by West Asbury Park Water Co. to supply (press rept.) portions of Neptune township. SUPPLY.—Lake Kisner and artesian wells, pumping to stand-pipe. Lake has cap. of 10,000,000 galls. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Worthington comp. non-cond. (rept. by makers as under construction in Jan., '97.) FINANCIAL.—Est. cost, $150,000. MANAGEMENT.—Prest., Dr. G. H. Griffus, 19 Broadway, N. Y. City. Rept. by V.-Prest., Washington White, Asbury Park, Nov. 7, '96.

26. **WESTFIELD,** Union Co. (2,739.) See Union Water Co., Elizabeth.

39. **WEST HOBOKEN,** Hudson Co. (11,665.) Supply from Hoboken. REFERENCE.—Eng. News, May 9, '85.

89. **WEST ORANGE,** Essex Co. (4,358.) West Orange Water Co. has contract with Montclair Water Co. for water for 25 yrs. from May, '98. Feb. 13, '97, C. Ph. Bassett, Summit, rept.: "Under existing conditions the West Orange Water Co. has no information to be given to the public."

90. **WESTWOOD,** Bergen Co. (Est., 475.) Built in '94 by C. S. De Baun. No legal difficulties. SUPPLY.—Artesian wells. PUMPS.—Cap., 288,000 galls.; Knowles and Worthington, 144,000 each. TANKS.—Cap., 60,000 galls.; wood, on brick tower, 25 × 30 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 209; made by owner. Services, lead; paid for by consumer. Meters, very few; owned and controlled by owner of works; repairs paid by consumer. Use of meters compulsory for hotels and consumers with large lawns. Owner can compel the use of meters and any consumer may have one. Hydrants, public, 15; private, 6. CONSUMPTION.—Varies. PRESSURE.—Ordinary, 30 lbs.; fire, 40 lbs. FINANCIAL.—Cost, $20,000 to $25,000. No debt. MANAGEMENT.—Rept. by owner, Aug. 13, '96. SEWERS.—None.

91. **WILDWOOD,** Cape May Co. (Not given.) Built by Wildwood Water Co. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia, Pa. SUPPLY.—Two artesian wells, 1,000 ft. and 850 ft. deep. PUMPS.—Cap., not given; two Downie double acting, driven by Buckeye engine. Anthracite pea coal used. TANK.—Cap., 80,000 galls.; iron, on iron trestle 75 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, w. i. and cem., 3 miles. Taps made by Co. for $3.50. Services, lead and iron; paid for by consumer. Meters, 32; owned, controlled and repaired by Co.; yearly rental, 10% of cost. Use of meters compulsory for all consumers. Hydrants, 20. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. W. Hawley; Secy., H. Bayard Hodge, Philadelphia, Pa.; Treas., N. B. Cox; Supt., Nelson S. Hays. Rept. by American Pipe Mfg. Co., June 8.

P 4. **WOODBRIDGE AND CARTARET,** Middlesex Co. (Woodbridge township, 4,665; Cartaret, est., 500.) Middlesex Water Co., incorp. Apr. 14, '96, with authorized cap. stock of $100,000, by Henry L. Dudley, New Haven, Conn.; Frank I. Wheeler, Elizabeth; Jno. B. Newhall, Stapleton, N. Y., and others. Nov. 9, '96, Mr. Newhall rept. that project might be taken up in spring of '97; supply, South branch of Rahway River.

92. **WOODBURY,** Gloucester Co. (3,911.) Built in '86 by village. SUPPLY.—Mantua Creek, pumping from settling to distributing reservoir; direct pumping (in '89) in case of fire. PUMPS.—Cap., 2,750,000 galls.; Gordon, 1,500,000; Worthington, 1,250,000. Supply main (in '89), 12-in., 2 miles long. Bituminous coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 1,250,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 13 miles; cost extensions met by income. Taps, 750; made by city for $2. Services, galv. i.; paid for by owner. Meters, 0. Any consumer may have a meter. Hydrants, 82. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary,

45 lbs. FINANCIAL.—Cost, $81,542. Bonded debt, $72,000; $10,000 due every 5 years. Sinking Fund, $5,600, invested at 5%. Expenses, Operating, $2,873. Revenue, $9,668: Consumers, unmetered, $7,638; water tax, $2,000. Deficits met by taxation for sinking fund. MANAGEMENT.—Chn., I. H. Ladd. Rept. by Supt., Ben. C. Brown, June 6. SEWERS.—None.

93. **WOODSTOWN,** Salem Co. (556.) Built in '92 by town; put in operation Nov. 10. Engr., Isaac S. Cassin, Philadelphia. FRANCHISE.—Rates are regulated by city. Co. is exempt from local taxes. City to pay $600 per annum. No legal difficulties. SUPPLY.—Six artesian wells, pumping to stand-pipe. Press rept. states wells siphon into 20 × 28 ft. receiving well. PUMPS.—Cap., 850,000 galls.; Deane comp. dup. Anthracite pea coal used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 874,400 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 126; made by town. Services, galv. i.; paid for by consumer. Meters, 0. Any consumer may have a meter. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $33,000. Bonded debt, $33,000, at 4½%. Expenses, Operating, $921. Revenue, $1,005. MANAGEMENT.—Supt., Benjamin Stevenson. Rept. by Supt., June 16. SEWERS.—None.

PENNSYLVANIA.

D ¼. **ABBOTTSTOWN,** Adams Co. (Est., 500.) Small domestic works, owned by W. W. Hafer. Supply, springs, by gravity.

299. **ADAMSFORD,** Delaware Co. See Swarthmore.

1. **ADRIAN MINES** (De Lancey P. O.), Jefferson Co. (Est., 1,200.) Built in '86 by Rochester & Pittsburg Coal & Iron Co. SUPPLY.—Artesian well, 300 ft. deep, pumping to tanks. PUMPS.—Cap., not given; three No. 7 Cameron. TANKS.—Cap., 3,700 galls.; four 800, one 500 galls. DISTRIBUTION.—Mains (in '88), 3 miles. Taps, 17. (In '89, 17 taps supplied 200 houses and 450 coke ovens.) Hydrants, 9. CONSUMPTION.—Av., 12,000 galls. FINANCIAL.—Cost, $5,000. No debt or revenue. Expenses, $1,780. NOTE.—No report since '90-1 Manual.

2. **ALLEGHENY,** Allegheny Co. (105,287.) Built in '47 by city. SUPPLY.—Allegheny River, pumping to reservoir and direct. Old intake, 1½ miles above junction of Allegheny and Monongahela rivers. Works for new supply are under construction, including intake crib in river, pumping station and 60-in. riveted steel force main, about 10 miles long. Engr., Robt. Swan, Allegheny. Principal Asst. Engr. on pipe line, F. J. Gubelman. Contrs. for force main, T. A. & R. G. Gillespie, Pittsburg. Engr. for Contrs., Frank Wilcox. PUMPS.—Cap., 84,500,000 galls.; 2—7,000,000 Allis; 2—5,000,000 Wilson & Snyder; 1—9,000,000 Lowry; 1,500,000 Laidlaw-Dunn-Gordon. 3—12,000,000 Groshon vert. comp. differential plunger under construction for new supply. Bituminous slack used; av. cost, $1.30 per short ton, or 5 cts. a bushel. RESERVOIR.—Cap., 7,000,000 galls.; elev., 217 ft. above city datum. TANKS.—Cap., 1,440,000 galls. Six, steel; one tank on steel trestle, one on frame trestle, each 581 ft. above city; four on masonry foundation, 480 ft. above city. FISCAL YEAR CLOSED March, '93. DISTRIBUTION.—Mains, 120 miles; cost extensions met by appropriations. Taps made by city, paid for by owner. Services, lead; paid for by owner. Meters, 12; owned by consumer; controlled and repaired by city. Use of meters optional with consumer. Hydrants, public, 1,500; private, 14. CONSUMPTION.—(Galls.) av., 28,000,000; max., 32,000,000; min., 24,000,000. PRESSURE.—Ordinary, 5 to 210 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $2,225,000. Bonded debt, as rept. Feb. 28, '94, $1,031,000: $150,000, at 6%, due '94 and '95; $40,000, at 5%, due Jan. and July, '97; $841,000, at 4%, due 1903-14. Since Feb., '94, large amount of bonds have been issued for new works. Expenses, Operating, $80,000. Revenue (in '90), including allowance for fire protection, $270,000. MANAGEMENT.—Director of Pub. Wks., Robt. McAfee; Supt., Jno. L. Brown. Rept. by Supt., Aug. 8, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, June 18, '81; gate valves, Aug. 29, '95, illus.; steel conduit, Oct. 10, '95, illus.

3. **ALLENTOWN,** Lehigh Co. (25,228.) Now owned by city. Built in '27 by Northampton Water Co., which was incorp. in '16, reorganized after building works as Allentown Water Co., and sold works to borough in '65 for $140,000. SUPPLY.—Springs, pumping to reservoir and stand-pipe. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Knowles comp. Anthracite pea coal used; av. cost, $1.80 per short ton, delivered. RESERVOIR.—Cap., 410,000 galls.; two, covered. STAND-PIPE.—Cap., 20,700 galls.; 7 × 76 ft. FISCAL YEAR CLOSED Apr. 6, '96. DISTRIBUTION.—Mains, 38.8 miles; cost extensions met by appropriations by councils and assessments on property owners. Taps, 7,000; made by city. Services, lead; paid for by owner. City cannot compel and may prohibit use of meters. Hydrants, public, 269; private, 10. CONSUMPTION.—(Galls.) av., 4,000,000. PRESSURE.—5 to 71 lbs. Four steam fire engines are used. FINANCIAL.—Cost, $900,000. Bonded debt, $69,300, at 4 and 5%, due in '99 and 1903. Sinking Fund, $12,000. Expenses: Operating, $18,000; int., about $5,200. Revenue, about $57,000. MANAGEMENT.—Comrs. Prest., Hiram J. Sterner; Secy., J. J. Snyder; City

Engr., Robt. S. Rathbun; Supt., C. C. Bingaman; Ch. Pump. Engr., John W. Grats. Rept. by Supt., Jan. 14, '97. PROJECTED IMPROVEMENTS.—New stand-pipe. SEWERS.—Has sewers. REFERENCES.—Eng. News, Dec. 3, '81.

4. **ALTOONA,** Blair Co. (30,837.) Built in '71 by city; a 360,000,000-gall. impounding reservoir was built in '96. Engrs., Stanwix Engineering Co., Rome, N. Y. Contrs., Collins & Martin. SUPPLY.—Springs and streams, by gravity. RESERVOIRS.—Cap., 428,000,000 galls. Impounding, at Kittanning Point: Old, 65,000,000; new, 360,000,000. Distributing, near city, 3,000,000. FISCAL YEAR CLOSED March 31, '96. DISTRIBUTION.—Mains, 47 miles, 24 to 2-in.; cost extensions met by income and frontage tax of 25 cents per ft. Taps, 7,597; made by city at $2 for ¾-in. Services, galv. i.; paid for by property owner. Meters, 73; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one; compulsory for breweries, large hotels and mills. Hydrants, public, 281; private, 1. CONSUMPTION.—(Galls.) av., 2,000,000; max., 3,000,000; min., 1,750,000. PRESSURE.—Ordinary and fire, 55 lbs. Steam fire engines are used. FINANCIAL.—Cost, $579,000. Bonded debt, $259,000, at 4%, due 1903; $220,000, at 4%, due after 10 yrs. Sinking Fund, $3,957. Revenue, $59,608: Consumers, $54,979; frontage tax, $2,401; taps, permits and misc., $2,223; City, none. MANAGEMENT.—Chn., T. H. Wiggins; Secy., C. A. Martin; Supt., S. A. Galley. Rept. by Secy., Sept. 22, '96. PROJECTED IMPROVEMENTS.—Settling basin and flood water channel to be completed in '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 27, '81; accident to earth dam, June 7 and 28, '94.

5. **AMBLER,** Montgomery Co. (1,073.) Built in '93 by Ambler Spring Water Co. Engr., Dr. R. V. Mattison. No Contr. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 60,000,000 galls.; impounding, 50,000,000; distributing, 10,000,000. FISCAL YEAR CLOSED JUNE 30, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by loans. Taps, 160; made by consumer; 50 cts. fee paid to Co. Services, galv. i.; paid for by consumer. Meters: 2; owned and controlled by Co. Co. can compel use of meters and any consumer may have one; compulsory for hotels and R. R. Co. Hydrants, public, 14; private, 6. CONSUMPTION.—(Galls.) av., 500,000. Chemical works use most of the water. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cost, $90,000. Cap. Stock: Authorized, $25,000; all paid-up; paid 6% div'd. Debt. $60,000, at 6%. Expenses, $5,600: Operating, $1,000; int., $3,600; rental, taxes, etc., $1,000. Revenue, $10,350: Consumers, $10,000; City, fire protection, $350. MANAGEMENT.—Prest. and Supt., Richard V. Matteson, M. D.; Secy. and Treas., Geo. R. Wallace. Rept. by Prest., Aug. 17.

6. **ANNVILLE,** Lebanon Co. (1,283.) Built in '90-1 by Annville Water Co.; put in partial operation Jan. 1, '91. SUPPLY.—Springs, by gravity. RESERVOIR.—(In '90) Cap., 200,000 galls. DISTRIBUTION.—Mains (in '90), 2 miles; 8 to 4-in. c. i. Taps, 81; about 5 to 10 new taps are added yearly. Meters, 0. Hydrants, not given. PRESSURE.—Ordinary, 52 lbs. FINANCIAL.—Cost, $21,000. Cap. Stock: Authorized, $20,000; all paid-up; $3,000 owned by corporation; liabilities, $200; assets (in form of rents), about $500. MANAGEMENT.—Prest., H. H. Kreider; Secy., C. Dean; Treas., G. R. Kreider. Rept. by Treas., Sept. 28, '96.

D 1. **ANSONVILLE,** Clearfield Co. (Est., 500.) Built in '90 by Ansonville Water Co. No legal difficulties. Supply, springs, by gravity from three reservoirs with combined cap. of 20,000 galls. Mains, ¾ mile. Taps, 50; made by Co. for $5. Services, galv. i.; paid for by owner. Meters, 0. Pressure, Ordinary, 30 lbs. FINANCIAL.—Cost, $1,800. No floating debt or sinking fund. Expenses: Operating, $10. Prest., J. C. Wise; Secy. and Supt., J. C. Davison; Treas., C. D. McMury. Rept. by Secy., June 8, '96. SEWERS.—None.

7. **ANTRIM,** Tioga Co. (Est., 1,856.) Built by Fall Brook Coal Co., which "owns the town," for general supply. Rept. by O. E. Crediford, Agt., Sept. 1, '96.

8. **APOLLO,** Armstrong Co. (2,156.) Built in '88 by Apollo Water Co. SUPPLY.—Kiskiminatas River, pumping to four tanks. PUMPS.—Cap., not given; Keystone. DISTRIBUTION.—(In '88.) Mains, 8 to 4-in., length not given. Hydrants, 20. FINANCIAL.—Cost, $15,000. Revenue: City, fire protection, $500. MANAGEMENT.—Prest., Jno. Duff; Secy., O. Tinsman; both of Parker's Landing; Supt., A. Randolph. NOTE.—No report since '90-1 Manual.

9. **ARCHBALD,** Lackawanna Co. (4,082.) Built in '75 by Archbald Water Co. Press rept., Oct., '94, stated Peckville Water Supply Co. had voted to consolidate with this Co. No legal difficulties. SUPPLY.—Laurel River, by gravity from impounding reservoir. RESERVOIR.—Formed by timber dam 250 above and 2,000 ft. from town. DISTRIBUTION.—Mains (in '90), 4 miles. Taps, 800; made by Co., free. Services, galv. i.; paid for by owner. Meters: 10; controlled and repaired by Co. Co. can compel use of meters, and only hotels may have them. Hydrants, 20. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $140,000. Cap. Stock: Authorized, $100,000. Bonded debt (in '90), $8,000, at 5%, due in 20 yrs. MANAGEMENT.—Prest., J. J. Williams; Secy., Thos. Law; Treas., Jno. Carroll; Supt., S. W. Arnold. Rept. by Treas., Aug. 8, '96. SEWERS.—None. REFERENCE.—Eng. News, Feb. 23, '84

37. **ARDMORE,** Montgomery Co. (2,205.) See Bryn Mawr.

226. **ASHBOURNE,** Montgomery Co. (Est., 456.) See Oak Lane.

10. **ASHLAND,** Schuylkill Co. (7,846.) Built in '76 by borough. SUPPLY.—Little Mahanoy Creek and artesian wells, by gravity. RESERVOIRS.—Cap., 14,000,000 galls.; 6,000,000 and 8,000,000. First reservoir formed by dam across stream, about 5 miles from, 345 ft. above town. Supply main (in '89), 12-in. c. i., 27,400 ft. long. FISCAL YEAR CLOSED March 1, '96. DISTRIBUTION.—Mains, 22 miles; cost extensions met by income. Taps, made by borough for $3. Services, lead and iron; paid for by consumer. Meters: 5; owned, controlled and repaired by borough. Borough can compel use of meters, and any consumer may have one; compulsory for manufacturers. Hydrants, 82. CONSUMPTION.—(Galls.) av., 480,000; max., 600,000; min., 300,000. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $96,000. Bonded debt, $48,000, at 4%; due '96 and 1901. Expenses, $4,761: Operating, $2,841; int., $1,920. Revenue: Consumers, $8,336. MANAGEMENT.—Chn., Geo. Keller; Secy., Frank Rents; Treas., Geo. R. Schnell; Supt., F. Mendler, Jr. Rept. by Secy., Aug. 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 17, '82.

336, 337. **ASHLEY,** Luzerne Co. (3,192.) Supply from Crystal Springs Water Co., Wilkes-Barre.

11. **ASPINWALL,** Allegheny Co. (Not given.) Since Feb., '96, owned by Aspinwall Water Co. Built in '90 by Aspinwall Land Co. Engr., S. D. Miller. No Contr. FRANCHISE—99 yrs. Co. is exempt from local taxes. City to pay $15 per yr. per hydrant. SUPPLY.—Two 10-in. driven wells, 63 ft. deep, running to bed-rock, pumping to elevated tanks. PUMPS.—Cap., 30,000 galls.; two Downie vert. double-acting. Bituminous run of mine coal used; av. cost, $1.40 per short ton. TANKS.—Cap., 40,000 galls.; two elevated, pine; water is pumped into mains and surplus passes to tanks. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by Co. Taps, 160; made by Co. for $3.50. Services, lead; paid for by consumer. Meters: 160; owned and controlled by consumer; repairs made by Co. at consumer's expense. Use of meters compulsory for all services. Hydrants, 22. CONSUMPTION.—No record. PRESSURE.—Ordinary and fire, 108 lbs. FINANCIAL.—Cost, about $25,000. No floating debt. Revenue: City, fire protection, $330. MANAGEMENT.—Prest., H. J. Heins; Secy., Geo. L. Walter; Supt., S. D. Miller; Ch. Pump. Engr., W. G. Brenner. Rept. by Supt., Aug. 7, '96. SEWERS.—Has sanitary and storm sewers.

271. **ATHENS,** Bradford Co. (3,274.) Supply from Sayre.

12. **AUDENRIED,** Carbon Co. (Est., 3,847.) Built in '59 by Lehigh & Wilkes-Barre Coal Co.; supplies collieries and village. SUPPLY.—Honey Brook Water Co. DISTRIBUTION.—Mains, 3 miles. Hydrants, about 10. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Withheld. NOTE.—No rept. since '90-1 Manual.

13. **AUSTIN,** Potter Co. (1,679.) Built in '90-1 by Lumber City Water Co. Fire protection works built '88-9 by borough. SUPPLY.—Springs, by gravity for domestic use and by pumping in case of fire. PUMPS.—Cap., 3,600,000 galls.; three Dean, one Knowles, one Snow. RESERVOIRS.—Cap., 475,000 galls. DISTRIBUTION.—Mains, 4¾ miles, 6 to 8-in. Taps, 240. Meters, 0. Hydrants, 17. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. FINANCIAL.—Cap. Stock, $15,000; all paid-up. No debt. Revenue: City, fire protection, $150. MANAGEMENT.—Prest., A. S. Heck; Secy., Treas. and Supt., Geo. D. Hellwig. Rept. by Secy., Sept. 28, '96.

P 2. **AVALON,** Allegheny Co. (Not given.) Riverview Water Co., incorp. Sept. 19, '94, with cap. stock of $1,000, $100 paid in; Treas., John Johnson, Bellevue, Pa. Construction had not been started to Nov., '96. Rept. that this Co. will practically be consolidated with those at Bellevue and Ben Avon, all getting supply from same source. See Ben Avon.

P 3, 337. **AVOCA,** Luzerne Co. (3,031.) Borough proposes to build works in '97. Supply, springs, pumping to stand-pipe. See Spring Brook Water Supply Co., Wilkes-Barre.

37. **BALA,** Montgomery Co. See Bryn Mawr.

14. **BANGOR,** Northampton Co. (2,509.) Built in '86 by Bangor Water Co. In '95 people voted in favor of buying or building works and borough offered Co. $25,000 for works, which was refused. Peter A. Speer and others were appointed com. to investigate and report on plan for further action. FRANCHISE.—Perpetual. Hydrant rental, $25 each. SUPPLY.—Spring, by gravity. RESERVOIR.—Small. DISTRIBUTION.—(In '88.) Mains, 4¼ miles. Taps, 100. Services, lead. Hydrants, 11. FINANCIAL.—(In '88.)—Bonded debt, $15,000, at 6%. NOTE.—No rept. since '90-1 Manual.

P 4. **BARNESBORO,** Cambria Co. (Not given.) Barnesboro Water Co. incorp. Sept. 30, '96. Cap. stock, $15,000; $1,500 paid in. Treas., John Barnes.

15. **BEAVER,** Beaver Co. (1,552.) Built in '12 by borough, supply then being from spring through oak log having 2-in. bore. In '86 works were rebuilt (?). Rept. in '90-1 Manual that these works were sold in '91 to Valley Water Co., Rochester, must have been an error. SUPPLY.—Springs and driven wells, pumping direct and to reservoir. Wells are sunk in bed of Ohio River. PUMPS.—400,000 galls.; Dean. RESERVOIRS.—Cap., 500,000 galls.; three, covered. DISTRIBUTION.—Mains, 7 miles; cost extensions met by taxation. Taps, 425. Services, lead. Meters, 0. Hydrants, 25. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary and fire, 25 lbs. FINANCIAL.—Cost, "could be built now for $20,000." Expenses: Operating, $1,500. Revenue, none, all ex-

penses being met by general taxation. MANAGEMENT.—Three Comrs.; Prest., Jno. R. Eakin; Treas., I. P. Stone. Rept. by J. N. Ramsey, Monaca, Nov. 30, '96.

P 5. **BEAVER BROOK** (No P. O.), Luzerne Co. (Not given.) Beaver Brook Water Co., incorp. Jan. 27, '96. Authorized cap. stock, $2,000. Dec. 4, '96, Abraham S. Schropp, Treas., Bethlehem, Pa., rept. Co. had organized, but had not yet built works.

16, P 5½. **BEAVER FALLS**, Beaver Co. (9,735.) Built in '75 by Beaver Falls Water Co.; reorganized in '90 as Union Water Co. FRANCHISE.—Perpetual. Co. not exempt from local taxes. LEGAL DIFFICULTIES.—In '95 borough voted for municipal works and contracts were partly let, but Co. secured permanent injunction restraining borough from going on. Another Co. may be organized in the interests of the borough. (Press repts.) SUPPLY.—Beaver River, pumping direct and to reservoir. PUMPS.—Cap., 7,250,000 galls.; water-power pumps, Holly, Wilson & Snyder, Worthington. FILTERS.—Cap., 2,000,000 galls.; Hyatt (or New York). RESERVOIR.—Cap., 3,000,000 galls. DISTRIBUTION.—Mains, 30 miles. Taps, 1,800. Meters, not given. Hydrants, 175. CONSUMPTION.—(Galls.) av., 4,500,000. PRESSURE.—Ordinary (at pumps), 90 lbs. FINANCIAL.—Cost, $365,000. Expenses: Operating, $4,500. Revenue, $32,000. MANAGEMENT.—Secy. and Treas., Saml. A. Roeloss, Ellwood City; Supt., T. M. Welsh. Rept. by Secy., Nov. 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Oct. 1, '81; investigation of yield of water-bearing gravel for proposed municipal plant, Aug. 20, '96, illus.

PROJECTED WORKS.

Feb. 3, '97, S. S. Kring, Secy. College Hill Water Co., rept. Co. has been chartered and expected to build works in spring of '97. Supply, wells, near Beaver River. Est. cost, $100,000.

17. **BEAVER MEADOWS**, Carbon Co. (Est., 1,146.) Built in '96 by Citizens' Water Co. No Engr. Contr., J. M. Stauffer. FRANCHISE.—500 yrs. from '95. SUPPLY.—Spring, by gravity. RESERVOIRS.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 100; made by plumbers; borough's fee, 25 cts. Services, paid for by owner. Meters, 0. Hydrants, 7. FINANCIAL.—Cost, $6,000. Cap. Stock: Authorized, $4,000; all paid-up. No floating debt. MANAGEMENT.—Prest., Jas. Rowe; Secy., J. M. Stauffer; Treas. and Supt., Jno. Martyn, Sr. Rept. by Secy., Aug. 10, '96. SEWERS.—None.

18. **BEDFORD**, Bedford Co. (2,242.) Built in '72-6 by town. SUPPLY.—Mountain springs, by gravity. (A 500,000-gall. Worthington pump rept. by maker in '96.) RESERVOIRS.—Cap., about 2,000,000 galls. DISTRIBUTION.—Mains, 7 miles. Taps, 214. Hydrants, 16. FINANCIAL.—Cost, $34,000. Bonded debt, $23,500, at 6%. Expenses: Operating, $500. Revenue, derived indirectly from taxation, $2,900. MANAGEMENT.—Water Comrs. NOTE.—No rept. since '88-9 Manual. REFERENCE.—Eng. News, Oct. 1, '81.

19. **BELLEFONTE**, Center Co. (3,946.) Built in '07 by borough. SUPPLY.—springs, pumping to reservoir. PUMP.—Cap., 1,440,000 galls; Knowles. (Makers rept. a 1,500,000 Worthington comp. non-cond.) RESERVOIR.—Cap., 290,000 galls.; 196 ft. above pumps. DISTRIBUTION.—Mains, 10 miles. Hydrants, 40. FINANCIAL.—Cost, $120,000. Bonded debt, $100,000, at 5, 6 and 7%. Expenses, Operating, about $4,000. Revenue, Consumers, $8,000. NOTE.—No rept. since '88-9 Manual. REFERENCE.—Eng. News, Mar. 24, '83.

20. **BELLEVERNON**, Fayette Co. (1,147.) Built in '95 by Bellevernon Water Co. Engr., Albert Smith, Saltsburg. FRANCHISE.—99 yrs. from '94. No legal difficulties. SUPPLY.—Monongahela River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls. 2—500,000; Laidlaw-Dunn-Gordon dup. Bituminous run of mine coal used; av. cost, 75 cts. per short ton. RESERVOIR.—Cap., 1,000,000 galls.; distributing. DISTRIBUTION.—Mains, not given; cost extensions met by receipts. Taps, 108; made by Co. for $6. Services, lead; paid for by consumer. Meters: 9; owned and repairs paid for by consumer; controlled by Co. Use of meters optional with consumer. Hydrants, 24. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 80 to 160 lbs. FINANCIAL.—Cost, about $33,000. Cap. Stock: Authorized, $30,000; paid-up, $18,000. Debt: Floating, $7,000 at 6%; bonded, $9,000 at 6%; due in 1905. No sinking fund. MANAGEMENT.—Prest., S. F. Jones; Secy. and Treas., J. S. Joncs; Supt., E. J. Ginler. Rept. by Secy., Dec. 8, '96. SEWERS.—None.

337. **BELLEVILLE HEIGHTS** (P. O. Scranton), Lackawanna Co. (Not given.) See Spring Brook Water Supply Co., Wilkes-Barre.

P 6. **BELLEVUE**, Allegheny Co. (1,418.) Valley Consolidated Water Co., incorp. Dec. 7, '96. Cap. stock, $100,000; paid in, $10,000. Treas., T. Lee Clark. Press rept. Jan. 21, '97, stated Avalon and Ben Avon will be supplied. See Ben Avon. In '94 Bellevue Water Co was incorp.

189. **BELLEVUE** (P. O. Scranton), Lackawanna Co. Supply from Minooka.

21, 22. **BELLWOOD**, Blair Co. (1,146.)

BOROUGH WORKS.

Built in '98; put in operation about Jan. 1, '94. Engr., H. F. Gettleman. Contr., John Donahue. SUPPLY.—Laurel Run, by gravity. RESERVOIRS.—Cap., not given; intake dam. FISCAL YEAR CLOSED Dec., '96. DISTRIBUTION.—Mains, 2½ or 3 miles; cost

extensions met by taxation. Taps, 169; made by consumer for $5. Services, cost is paid for by borough to curb, thence by consumer. Use of meters optional with consumer. Hydrants, public, 28. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—No debt. MANAGEMENT.—Secy., T. F. Lindsay; Treas., D. L. Wray. Rept. by Secy., Jan. 27, '97. SEWERS.—No sewers.

BELLWOOD WATER CO.

Built in '93. Engr., E. B. Kay. Contr., B. G. Coon, Kingston. SUPPLY.—Bell's Run, by gravity. DISTRIBUTION.—Mains, 5 miles. Taps, 50. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $20,000; all paid-up. Bonded debt, $20,000, at 5%: bonds authorized, $25,000. Expenses: Operating, $1,000. Revenue: Consumers, $1,200. MANAGEMENT.—Prest., Jno. E. Bell; Secy. and Supt., M. Stuart; Treas., A. A. Stevens. Rept. by E. B. Kay, March 2, '96. SEWERS.—None.

247. **BELTZHOOVER,** Allegheny Co. (2,009.) Supply from Monongahela Water Co. Also rept. by J. W. Hughes, Borough Clerk, as supplied by St. Clair Water Co. (See Pittsburg). Prest., J. F. Grimes, Knoxville, Pa. Press rept. states that Monongahela Water Co. has supplied water for domestic purposes for some time and that in May, '95, contract for fire protection was made with other Co.

23. **BEN AVON,** Allegheny Co. (Not given.) Under construction in '96 by Ben Avon Water Co. Rept. that these works will supply Cos. at Avon and Bellevue. FRANCHISE.—10 yrs. absolute; with option of purchase of works by city at end of 10 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $35 each per yr. for 135 hydrants. No legal difficulties. SUPPLY.—Wells on Neville Island in Ohio River, pumping to storage reservoir. PUMPS.—Cap., 3,000,000 galls. Bituminous, run of mine coal used; av. cost, $1.55 per short ton. DISTRIBUTION.—Mains, 22 miles; cost extensions met by Co. Taps, will be about 800; made by Co. for $3.25. Services, lead; paid for by Co. to curb. Meters, 0. Use of meters optional with consumer. Hydrants, 135. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000; all paid-up. Revenue: City, fire protection, $4,725. MANAGEMENT.—Prest., E. P. Battsford; Secy., F. Boone; Treas., J. W. Davidson; Supt., John Johnston. Rept. by W. J. Dunn, Dec. 4, '96. SEWERS.—Has storm and partial sanitary sewers.

24. **BERWICK,** Columbia Co. (2,701.) Built in '48 by Berwick Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates, not subject to regulation by city. SUPPLY.—Spring on river bank, pumping to reservoirs. PUMPS.—Cap., 2,000,000 galls.; 1,500,000 Worthington, non-comp. non-cond.; 250,000 Blake; 250,000 Mayer. Anthracite buckwheat coal used; av. cost, $1.25 per short ton. RESERVOIRS.—Cap., 22,000,000 galls.; two distributing, 14,000,000 and 8,000,000. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 21 miles. Taps, 725; made for consumers by licensed plumbers for $1.50. Services, galv. i.; paid for by consumer. Hydrants, public, 31; private, 10. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 72 lbs. FINANCIAL.—Cost, $102,000. Cap. Stock: Common, authorized, $40,000; paid-up, $6,000; paid 5% div'd in '94. Pref'd, authorized, $50,000; paid-up, $40,000. Bonded debt, $60,000, at 5%, due 1944. Expenses, $5,550: Operating, $2,250; int., $3,000; taxes, $300. Revenue: Consumers, $7,600; City, fire protection, $310. MANAGEMENT.—Prest., C. C. Evans; Vice-Prest., Fred. H. Eaton; Secy. and Treas., Wm. M. Hager; Supt., Geo. Depuy. Rept. by Treas., July 3, '96. SEWERS.—Has some storm sewers. REFERENCE.—Eng. News, Apr. 15, '82.

25. **BERWYN,** Chester Co. (Est., 826.) Built in '96 by Berwyn Water Co. Supplies Villa Nova, Upton, Radnor, St. David's, Wayne, Strafford, Devon, Berwyn, Daylesford, Paoli and Villiston township. SUPPLY.—Pickering Creek, pumping to distributing reservoir. PUMPS.—Cap., 2,000,000 galls.; Corliss comp. cond. Anthracite buckwheat coal used. FILTERS.—Cap., 750,000; Warren. DISTRIBUTION.—Mains, 30 miles. PRESSURE.—Ordinary, 50 to 300 lbs. FINANCIAL.—Witnheld. MANAGEMENT.—Prest., Howard Watkin; Secy., H. Bayard Hodge; Treas., Jno. W. Hawley, Media. Rept. by The American Pipe Mfg. Co., Philadelphia, June 8, '96.

26. **BETHLEHEM,** Northampton Co. (6,762.) Now owned by borough. Built in 1754-61 by Hans Christopher Christiansen; came under control of Bethlehem Water Co. in '45; sold to borough in '71 for $23,600. SUPPLY.—Spring and artesian well, pumping direct and to tanks. PUMPS.—Cap., 3,950,000 galls.; Deane comp., 2,000,000; Worthington, 750,000 and 500,000; Cameron, 700,000. TANKS.—Old: Cap., 225,000 galls., 40 × 24 ft. New: Cap., 743,000 galls.; 50 × 50 ft. FISCAL YEAR CLOSED Feb. 1, '95. DISTRIBUTION.—Mains, 9¼ miles. Taps, 1,117. Services, lead and galv. i. Meters, 0. Hydrants, 76. CONSUMPTION.—(Galls.) av., 771,570; max., 1,021,296. PRESSURE.—Ordinary (in '89), 82 lbs. FINANCIAL.—Cost, $100,000. Expenses: Operating, $4,600. Revenue, $11,385. MANAGEMENT.—Water Comrs. Supt. R. E. Neumeyer. Information from annual rept. for '94-5. SEWERS.—Partially sewered. REFERENCE.—Eng. News, Apr. 29, '82.

27. **BIRDSBOROUGH,** Berks Co. (2,261.) Built in '84 by E. & J. Brooke Iron Co., which is principal consumer. SUPPLY.—Indian Run, by gravity from impounding reservoir. Drainage area, 2½ sq. miles. RESERVOIR.—Cap., 25,000,000 galls.; 200 ft. above town. Press repts. state that freshet caused failure of dam in June, '92.

DISTRIBUTION.—Mains, 5¼ miles. Taps, est., 300. Meters, 0. Hydrants, 36. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $55,000. Bonded debt, none. NOTE.—No report since '88-9 Manual. REFERENCE.—Eng. News, Feb. 23, '84.

28. **BLAIRSVILLE,** Indiana Co. (3,126.) Built in '72 by borough. No legal difficulties. SUPPLY.—Conemaugh River, pumping to reservoir. PUMPS.—Cap., 160,000 galls.; McKnight. Bituminous coal used; av. cost, 50 cts. per short ton. Co. own coal mine. RESERVOIR.—Cap., 160,000 galls.; 112 ft. above highest part of town. FISCAL YEAR CLOSED April. DISTRIBUTION.—Mains (in '90), 8½ miles. Taps, 800; made by borough $1.25 for ½-in. and $2.25 for ¾-in. Services, lead; paid for by owner. Hydrants, public, 58; private, 2. FINANCIAL.—Cost, $35,000. Bonded debt, $10,000, at 5%; $22,000, at 4%. Expenses, Operating: $2,000. MANAGEMENT.—Comrs. Ch. Pump. Engr., Jno. T. Gray. Rept. by H. W. Ferguson, July 10, '96. SEWERS.—Has partial system of sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 22, '82.

29. **BLOOMSBURGH,** Columbia Co. (4,635.) Built in '80 by Bloomsburgh Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Fishing Creek, pumping to reservoir and direct. PUMPS.—Cap., 3,700,000 galls.; 1,200,000 Worthington comp. non-cond.; 2,500,000 Gaskill dup. Repts. by makers. RESERVOIRS.—Two; new one, 3,500,000 galls. DISTRIBUTION.—Mains, 7.5 miles. Taps, 470. Services, galv. i. Meters, 23. Hydrants, 48. CONSUMPTION.—(Galls.) av., 268,978. FINANCIAL.—Cost, $63,276. Cap. Stock: Authorized, $90,000; paid-up, $50,180; paid 6% div'd in '90. Press rept., Aug., '94, stated Co. had voted to increase cap. stock from $90,000 to $180,000. No debt. Expenses, $2,722: Operating, $2,169; int., $427; taxes, $126. Revenue, $7,730: Consumers, $6,770; City, fire protection, $960. SEWERS.—Has sewers. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 15, '82.

D 2. **BLUE RIDGE SUMMIT,** Franklin Co. (Not given.) Built in '95 by Montery Water Co. to supply water to those purchasing land from Montery Land Co. Engr., D. G. Aelsberger, Baltimore. SUPPLY.—Artesian well, pumping to tank. TANK.—Cap., 20,000 galls.; on tower 51 ft. high. FINANCIAL.—Cost, $5,000. MANAGEMENT.—Gen. Mgr., Jas Carey, Jr., 26 Light St., Baltimore.

—? **BOILING SPRINGS,** Cumberland Co. (Est., 550.) Put under construction in '95 by Cumberland Water Co. Aug. 28, '95. Co. reported it had secured franchises in Churchtown, Dillsburg, Mechanicsburg, New Cumberland and Shiremanstown, all within 14 miles of Boiling Springs. Same interests incorp. Carlisle Water Co. in '95 to supply Carlisle, and began work in '96, but was enjoined; see Legal Difficulties under Carlisle. Information from Mechanicsburg indicates that Co. has done nothing there. Dec. 21, '96, a citizen stated water was not being supplied in Boiling Springs. SUPPLY.—Springs, pumping to tank. Treas., H. T. Duke, 510 North 39th St., Philadelphia.

299. **BOONE,** Somerset Co. See Swarthmore.

30. **BOYERTOWN,** Berks Co. (1,436.) Built by Boyertown Water Co. SUPPLY.—Springs, pumping direct from reservoir. RESERVOIRS.—Cap., 25,000 galls. DISTRIBUTION.—In '87.) Mains, 3 miles. Hydrants, 6 or more. FINANCIAL.—Withheld. NOTE.—No report since '90-1 Manual.

31. **BRADDOCK,** Allegheny Co. (8,561.) Built in '84-5 by borough. SUPPLY.—Monongahela River, pumping direct. PUMPS.—Cap., 5,000,000 galls.; 2—2,500,000 Worthington. (Rept. by makers.) DISTRIBUTION.—Mains, 8 miles; cost extensions met by revenue. Taps, 644. Meters, 8. Hydrants, 67. FINANCIAL.—Cost (in '89), $100,000. Debt (in '88), $65,000: Floating, $15,000, at 4%; bonded, $50,000, at 4%. Sinking Fund (in '86), $2,500, not invested. Expenses (in '88): Operating, $5,000. Revenue (in '88): City, fire protection, $2,900. SEWERS.—Has sewers. NOTE.—No rept. since '90-1 Manual.

32. **BRADFORD,** McKean Co. (10,514.) Purchased by city in '81 for $19,400; built in '77 by Bradford Water-Works Co. SUPPLY.—Marilla and Gilbert brooks, by gravity from impounding reservoirs, and pumping from 6 driven wells as auxiliary. Drainage area of brooks, 20 sq. miles. PUMPS.—Cap., 5,750,000 galls.; 750,000 Worthington; 5,000,000 Gordon. (Repts. by makers.) RESERVOIRS.—Cap., 22,000,000 galls.: Gilbert Brook, 19,000,000; area, 10 acres; Marilla Brook, 3,000,000. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 29 miles; cost extensions met by income. Taps, 2,500; made by city for $2. Services, lead and galv. i.; paid for by owner. Meters, 15; owned, controlled and repaired by owner. Use of meters compulsory for water motors. City can compel use of meters in few cases and may prohibit same. Hydrants, public, 152; private, 8. CONSUMPTION.—(Galls.) av., 1,330,500. PRESSURE.—Ordinary and fire, 85 lbs. Steam fire engines are occasionally used. FINANCIAL.—Cost, $248,620. Bonded debt, $20,000, at 6%, due '98; $25,000, at 6%, due 1903. Sinking Fund, $7,600, deposited in bank. Expenses: Operating, $5,362. Revenue, $20,877. MANAGEMENT.—Prest., T. B. Clark; Secy., E. N. Hallock; City Treas., A. McLean; Supt., S. D. Heffner. Rept. by Secy., June 6, '96. PROJECTED IMPROVEMENTS.—Enlargement of reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 6, '82.

33. **BRIDGEPORT,** Montgomery Co. (2,651.) Built in '89-91 by Bridgeport Water Co.; put in operation Sept. 1, '91. No legal difficulties. SUPPLY.—Schuylkill River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Deane comp. dup. Anthracite

rice coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income. Taps, 400; made by Co. for $2. Services, w. i.; paid for by owner. Meters, 1; owned by consumer; controlled and repaired by Co. Co. can compel use of meter and any consumer may have one. Hydrants, 46. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $80,000. Cap. Stock, $40,000. Bonded debt, $40,000, at 5%. MANAGEMENT.—Prest., P. D. Wanner; Secy. and Treas., R. B. Kinsey, both of Reading; Supt., Saml. Coats; Ch. Pump. Engr., A. K. Coats. Repts. by Supt., July 11, '96, and Jan. 18, '97. PROJECTED IMPROVEMENTS.—Enlargement in pumping plant. SEWERS.—Has some sanitary sewers.

34. **BRISTOL,** Bucks Co. (6,553.) Built in '74-5 by Bristol Water Co. FRANCHISE.—20 yrs. from '74. Rates not fixed in franchise, not subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Delaware River, pumping to stand-pipes. PUMPS.—Cap., 3,000,000 galls.; Worthington, 2,000,000 comp. cond. and 1,000,000 high pressure. STAND-PIPES.—Old, cap., 30,000 galls.; 6 × 140 ft.; new, cap., 31,700 galls.; 6 × 150 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by income. Taps, 929; made by plumbers for $2. Services, lead; paid for by consumer. Meters, 3; owned by consumer; controlled by Co. Use of meters compulsory for mills. Hydrants, public, 60; private, 20. CONSUMPTION.—(Galls.) av., 900,000; max., 1,400,000; min., 600,000. PRESSURE.—Ordinary and fire, 60 lbs. One steam fire engine is used. FINANCIAL.—Cost, $73,450. Cap. Stock: Authorized, $85,000; paid-up, $73,450; paid 10% div'd in '96. Expenses: Operating, $4,000; taxes, $734. Revenue: Consumers, unmetered, $12,500; metered, $180. MANAGEMENT.—Prest., G. M. Dorrance; Secy., Chas. E. Scott; Treas., L. A. Hoguet; Supt. and Ch. Pump. Engr., A. K. Joyce. Rept. by Secy., July 20, '96. SEWERS.—None. REFERENCE.—Eng. News, Apr. 29, '82.

35. **BROOKVILLE,** Jefferson Co. (2,478.) Built in '88-5 by Brookville Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—North Fork Creek, pumping to tanks. Drainage area, 30 sq. miles. PUMPS.—Cap., 1,000,000 galls.; Worthington high pressure. TANKS.—Cap., 160,000 galls.; four; two on wooden trestle foundations, elevated 150 ft. above main part of town. DISTRIBUTION.—Mains, 7 miles. Taps, 208. Meters, 0. Hydrants, 27. FINANCIAL.—Cost, $28,000. Expenses: Operating, $1,800. Revenue, $4,100. MANAGEMENT.—Prest., Jos. Darr; Secy., Jackson Heber; Supt., W. R. Ramsey. Rept. by Secy., Sept. 28, '96. REFERENCE.—Eng. News, May 24, '84.

36. **BROWNSVILLE,** Fayette Co. (1,417.) Built in '90-1 by N. N. Madison. SUPPLY.—Springs, by gravity (and by pumping?). PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington high pressure. (Rept. by makers.) RESERVOIR.—Cap., 600,000 galls. DISTRIBUTION.—Mains, 1¼ miles, 6-in. w. i. Taps, 100. Hydrants, 13. PRESSURE.—Ordinary, 118 lbs. FINANCIAL.—Cost, $8,000. NOTE.—No rept. since '90-1 Manual.

38. BRUSHTON (P. O., Pittsburg), Allegheny Co. Now part of the city of Pittsburg. Supply from Pennsylvania Water Co., Wilkinsburg.

37. **BRYN MAWR,** Montgomery Co. (Est., 876.) Now operated by Bryn Mawr Division of Springfield Water Co. Built in '94 by Bryn Mawr Water Co., but not put in operation until Jan. 1, '96. Late in '96 Co. was bought by Springfield Water Co. Supplies also: Rosemont, Haverford, Ardmore, Narbeth, Wynnewood, Merion, Overbrook, Merionville, Bala and Cynwyd. SUPPLY.—Creeks and wells. PUMPS.—Corliss engine, with deep well and surface power pump. Anthracite pea coal used. FILTERS.—Cap., 250,000 galls.; Warren. RESERVOIRS.—Cap., 3,000,000 galls. STAND-PIPES.—Cap., 1,000,000 galls.; two, iron, 40 × 50 ft. DISTRIBUTION.—Mains, 50 miles. Taps, 640. Services, lead and iron; paid for by consumer. Meters, 640; owned, controlled and repaired by Co. Use of meters compulsory for all consumers. Hydrants, public, 0; private, 5. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 60 to 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., N. B. Cox; Secy., H. Bayard Hodge; Treas., Jas. W. Hawley; Supt., Enos Hart. Rept. by American Pipe Mfg. Co., Philadelphia, Pa., June 8, '96.

38. **BUTLER,** Butler Co. (8,734.) Built in '78 by Butler Water Co. FRANCHISE.—99 yrs. from '77. LEGAL DIFFICULTIES.—Much litigation over quality of water and rates charged while water was bad. Water made bad by pollution from oil wells. Co. sought new supply. Lower court fixed rates to be charged while water was bad, but State Supreme Court decided court could only say that rates must be lower, leaving the actual schedule to Co. SUPPLY.—Conoquenessing River, pumping to reservoir. New supply main, terra cotta; 7,300 ft. of 18-in., 25,000 ft. of 15-in., from new storage reservoir, above sources of pollution, to pump well; dy. cap. of main, 2,250,000 galls. PUMP.—Cap., 2,000,000 galls.; Worthington comp. cond. Natural gas used as fuel. RESERVOIRS.—Cap., 127,500,000 galls.: Storage, 125,000,000; distributing, 2,500,000. DISTRIBUTION.—Mains (in '90), 21 miles. Taps (in '90), 500. Services, lead; paid for by owner. Hydrants, 65. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 90 to 110 lbs. FINANCIAL.—Cost (in '89), $119,000. Cap. Stock: Authorized, $91,600; all paid-up. Bonded debt, $30,000, at 6%. MANAGEMENT.—Prest., W. G. Brandon; Secy. and Supt., W. B. Meredith; Treas., W. Pollock. Rept. by Secy., June 23, '96. SEWERS.—Has sanitary sewers.

39. **CANTON,** Bradford Co. (1,893.) Built in '80 by Citizens' Water Co. SUPPLY.—Lake and mountain brook, by gravity. RESERVOIRS.—Two, cap., 50,000 galls. each. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5 miles. Taps, 400; made by Co. for $2. Services, galv. i.; paid for by consumer. Meters (in '90), none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 36; private, 1. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 85 lbs.; fire, 90 to 140 lbs. FINANCIAL.—Cost, $25,000. Paid 6%% div'd in '95. Expenses, $546: Operating, $400; taxes, $146. Revenue: City, fire protection, $200; other purposes, $25. MANAGEMENT.—Prest., W. D. Crocker; Secy., N. C. Sechrist; Treas., J. E. Cleveland; Supt., Lee Brooks. Rept. by Supt., June 25. PROJECTED IMPROVEMENTS.—Sand filter. SEWERS.—None.

40. **CARBONDALE,** Lackawanna Co. (10,833.) Built in '68 by Crystal Lake Water Co. SUPPLY.—Springs, by gravity from storage to distributing reservoirs. RESERVOIRS.—Cap., 254,000,000 galls.; storage, 250,000,000; distributing, 4,000,000. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 16 miles. Taps, 1,996; made by Co. for $3. Services, iron; paid for by owner. Meters, 25; owned by Co. Use of meters compulsory for large consumers. Hydrants, public, 55; private, 11. CONSUMPTION.—(Galls.) av., 1,750,000. PRESSURE.—Ordinary, 40 to 105 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. B. Van Bergen; Secy., C. E. Spencer; Treas., A. Pascoe; Supt., Wm. McMullen. Rept. by Treas., Oct. 30, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 11, '82.

41. **CARLISLE,** Cumberland Co. (7,620.) Built in '54 by Carlisle Gas & Water Co.; city holds some of the stock and appoints 3 of the 8 directors. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. LEGAL DIFFICULTIES.—Co. has secured injunction in lower court against construction of works by Carlisle Water Co., incorp. in '95 to introduce water from Boiling Springs, which see. Appeal to State Supreme Court has been taken. SUPPLY.—Canodoquinet Creek, pumping to reservoirs. PUMPS.—Cap., 1,000,000 galls.; Deane, water power. FILTERS.—Cap., 1,500,000 galls.; Jewell. Rept. by makers as installed in '96. RESERVOIRS.—Cap., 2,500,000 galls.; two, on hill midway between pumps and town, 125 ft. above pumps. DISTRIBUTION.—Mains (in '88), 12 miles. Taps, 480. Services, lead. Meters, 3. Hydrants (in '91), 77. FINANCIAL.—Withheld. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Nov. 18, '82.

247. **CARNEGIE,** Allegheny Co. (Not given.) Supply from Monongahela Water Co. See Pittsburg. Press repts. state St. Clair Water Co. has laid mains here.

42. **CARROLLTOWN,** Cambria Co. (634.) Press repts. state works for general supply were built in '92 by borough. Original plan included brick-lined reservoir, 6,000 ft. 4-in. pipe and hydrants.

43. **CASHTOWN,** Adams Co. (Est., 146.) Built in '95 by Cashtown Water Co. for general supply. SUPPLY.—Spring, by gravity; 125 ft. fall. FINANCIAL.—Cost, $1,500. Cap. Stock, common, authorized, $2,000. MANAGEMENT.—Prest., H. L. Bream. Rept. by Geo. M. Schwartz, ex-Prest., Dec. 22, '96.

44. **CATASAUQUA,** Lehigh Co. (3,704.) Built in '75 by Crane Iron Works, which has incorp. Crane Water Co. FRANCHISE.—City to pay $12.50 per hydrant; $98 for school; town hall, $9. No legal difficulties. SUPPLY.—Lehigh River, pumping to reservoir and stand-pipe; filtered. PUMPS.—Cap., 800,000 galls. Pumping done by water power or by waste steam from furnaces owned by Crane Iron Co. FILTERS.—Cap., 700,000 galls.; Moore; sand. RESERVOIR.—Cap., 300,000 galls.; 125 ft. above pumps. STAND-PIPE.—Iron, 150 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5½ miles. Taps, 865; made by Co. Services, lead. Meters, 0. Hydrants, public, 46; private, 5. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary and fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $50,000. Bonded debt, $4,000, at 5%, due 1910. Expenses: Operating, $1,200. Revenue, $5,405. MANAGEMENT.—Prest. and Supt., Leonard Peckitt; Secy., David Davis. Rept. by Co., Aug. 11, '96. SEWERS.—None. REFERENCE.—Eng. News, Sept. 2, '82.

45. **CATAWISSA,** Columbia Co. (1,809.) Built in '82 by Catawissa Water Co. No franchise. No legal difficulties. SUPPLY.—Springs, by gravity and pumping to reservoir. PUMP.—Cap., 72,000 galls.; dup. Coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 300,000 galls.; on hill. DISTRIBUTION.—Taps, made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 24; private, 3. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Angelino Shuman; Secy. and Treas., P. H. Shuman. Rept. by Co., Dec. 29, '96.

D 3. **CENTRE HALL,** Centre Co. (441.) Built by Centre Hall Water Co., which is exempt from local taxes. Supply, springs, by gravity. Reservoir, cap., 80,000 galls. Mains (in '90), 1¼ miles. Taps, 85; made by Co. for $3. Services, iron; paid for by owner. Conmet by income. Taps, 85; made by Co. for $3. Services, iron; paid for by owner. Consumption (galls.) av., 40,000. Cost, $5,000. Cap. Stock, $5,000. Expenses: Operating, $250. Prest., Fred. Kurtz; Secy. and Supt., D. F. Luse; Treas., J. D. Murray. Rept. by Secy., July 10, '96.

D 4. **CENTRALIA,** Columbia Co. (2,761.) Built in '66-7 by Centralia Water Co. Franchise does not provide for purchase of works nor regulation of rates by city. Supply, mountain springs, by gravity. Four reservoirs. Mains, 3 miles. Taps, 250. Cost, $10,000. No rept. since '88-9 Manual.

46. **CHAMBERSBURGH,** Franklin Co. (7,863.) Built in '76 by city. Additional supply introduced July, '91. SUPPLY.—Conococheague Creek, pumping by steam and water power to reservoir. PUMPS.—Cap., 2,250,000 galls.; steam pump, Birkinbine, 1,000,000; power pump, Buffalo, 1,250,000. RESERVOIRS.—Cap., 3,500,000 galls.; 1,000,000 and 2,500,000. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 15½ miles; cost extensions met by income. Taps, 1,243; made by city for $2.50, $3 and $4 for ½-in., ¾-in. and 1-in., respectively. Services, lead and galv. i.; paid for by property owner. Meters, 1; owned by city. Hydrants, public, 88; private, 7. CONSUMPTION.—(Galls.) av., 860,000; max., 975,000; min., 728,000. PRESSURE.—Ordinary, 37 to 45 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $59,000. Expenses: Operating, $2,836. Revenue, $10,065. MANAGEMENT.—Comrs. Rept. by Supt., A. C. McGrath, Aug. 10, '96. SEWERS.—None. REFERENCE.—Eng. News, Sept. 29, '83.

—? **CHARLEROI,** Washington Co. (Not given.) Town Clk. rept. in '96 that town is supplied by a Co., water being pumped from river direct; also that a reservoir is projected. Charleroi Water Co. was incorp. in '90 and proposed to pump water from Monongahela River, but had done nothing up to Aug. 8, '91. Latter part '96 makers rept. one comp. cond. dup. and one comp. dup., both Deane, with total cap. of 3,000,000 galls.

47. **CHESTER,** Delaware Co. (20,226.) Now owned by Co. Built in '67 by city to supply south-ward. Bought and extended in '86 by New Chester Water Co., which also supplies the boroughs of Upland and South Chester. FRANCHISE.—Rates are subject to regulation by city. Co. is exempt from local taxes. SUPPLY.—Delaware River, pumping to reservoirs. PUMPS.—Cap., 8,000,000 galls.; 2—4,000,000 Gaskill hor. high duty. Anthracite pea coal used; av. cost, $2 per short ton. RESERVOIRS.—Cap., 16,000,000 galls.; two 8,000,000 storage. DISTRIBUTION.—Mains, 65 miles; cost extensions met by income. Services, galv. i.; paid for by consumer. Meters, 375; owned, controlled and repaired by Co. Co. can compel use of meter and any consumer may have one. Hydrants, public, 150; private, 20. CONSUMPTION.—(Galls.) av., 2,800,000; max., 3,000,000; min., 2,600,000. PRESSURE.—Ordinary and fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $2,500,000. Cap. Stock: Authorized, $1,600,000. Bonded debt, $800,000, at 6%. Expenses: Operating, $75,000; int., $4,800; taxes, $1,000. MANAGEMENT.—Prest., J. L. Forwood; Secy., W. H. Miller; Treas., Walter Wood; Supt., W. B. Chadwick. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 1, '81.

48. **CHRISTIANA,** Lancaster Co. (Est., 1,132.) Built in '94 by Christiana Gravity Water Co. Engr., Wm. Herr, Lancaster. Contrs., Kay & Coon. SUPPLY.—Springs, by gravity to reservoir. RESERVOIRS.—Cap., 45,000 galls.; storage, 20 x 30 ft., x 10 ft. deep, 1¾ miles from town. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income. Taps, 100; made by Co., free. Services, lead; paid for by Co. Meters, 0. Hydrants, 19. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $10,000; all paid-up. Floating debt, $4,000, at 5%. Revenue, $1,085: Consumers, $800; City, fire protection, $285. MANAGEMENT.—Prest., Dr. L. W. Pownall; Secy., B. Walter; Treas., S. Slocum; Supt., M. B. Kent. Rept. by Supt., Nov. 5, '96. SEWERS.—Has sanitary and storm sewers.

—? **CHURCHTOWN,** Lancaster Co. (Est., 420.) See Boiling Springs.

49. **CLARION,** Clarion Co. (2,164.) Built in '75 by Clarion Water Co. FRANCHISE.—Perpetual. SUPPLY.—Clarion River, pumping to stand-pipe. PUMPS.—Cap., 600,000 galls.; Wilson & Snyder, 400,000 comp. dup.; Worthington, 200,000 comp. dup. Natural gas used. RESERVOIRS.—Cap., 5,000,000 galls.; on McClain's Run, 100 ft. above, 4,400 ft. from pumps. Under construction at time of rept., but press rept., Oct., '96, stated it had just been completed. STAND-PIPE.—Cap., 224,000 galls.; 30 x 45 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 4 miles. Taps, 165; made by Co. Services, lead and iron; paid for by Co. Meters, 6; owned, controlled and repaired by Co. Hydrants, 29. CONSUMPTION.—(Galls.) max., 224,000; min., 128,000. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cap. Stock: Authorized, $24,000; paid-up, $18,000; paid 6% div'd in '95. MANAGEMENT.—Prest., D. C. Corbett; Secy. and Treas., W. H. Ross. Rept. by Secy., July, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 15, '84.

50. **CLAYSVILLE,** Washington Co. (1,041.) Built in '95 by borough. No Engr. Contr., S. G. Hallock. FRANCHISE.—Co. is exempt from local taxes. SUPPLY.—Stream, pumping to steel tank. DISTRIBUTION.—Hydrants, public, 30. PRESSURE.—Ordinary, 100 lbs. No steam fire engines used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., D. M. Campsey; Secy., A. I. Wells; Treas., W. J. E. McLain; Supt., Jno. King. Rept. by Prest., Aug. 7, '96. SEWERS.—Has storm sewers only.

51. **CLEARFIELD,** Clearfield Co. (2,248.) Built in '82-3 by Clearfield Water Co. Supplies West Clearfield. FRANCHISE.—Rates are not subject to regulation by town. SUPPLY.—Moose Creek, by gravity; Montgomery Creek, by gravity, since '93. DISTRIBUTION.—Mains, 20 miles. Taps, 600. Hydrants, 63. FINANCIAL.—Cost, $96,000. Cap. Stock, $50,000; all paid-up. MANAGEMENT.—Prest., W. W. Betts; Secy., J. B.

Newling; Treas. and Mgr., H. F. Bigler. Rept. by Secy., Sept. 30, '96. SEWERS.—Has partial system of sewers. REFERENCE.—Eng. News, Jan. 30, '86.

52. **COATESVILLE,** Chester Co. (3,680.) Built in '70-1 by borough. SUPPLY.—Spring, by gravity from collecting to distributing reservoir. RESERVOIRS.—Cap., 3,000,000 galls.: Collecting, 1,000,000. Distributing, 2,000,000. DISTRIBUTION.—Mains, 4.8 miles. Taps, 426. Hydrants, 60. FINANCIAL.—Cost, $82,000. Bonded debt, $76,980, at 4%, due 1911. Expenses, $3,790: Operating, $711; int., $3,079. Revenue, Consumers, $4,799. NOTE.—No rept. since '90-1 Manual, except statement from Chn. Water Com., Jas. G. Pugh, Dec., '96, that steps to increase supply were under consideration. REFERENCE.—Eng. News, Mar. 3, '83.

53. **COCHRANTON,** Crawford Co. (655.) Built in '93 by borough. No Engr. Contrs., Chandley Bros. SUPPLY.—Springs, by gravity. RESERVOIR.—Collecting, 250 ft. above town. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income. Taps, 125; made and paid for by borough, including service to curb. Services, galv. 1.; paid for by consumer from curb. Hydrants, 15. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $11,000. Bonded debt, $4,900, at 4½%, due '98; $4,900, at 4½%, due 1903. Sinking Fund, $1,000. MANAGEMENT.—Secy., Jno. H. Adams; Treas., Jesse Moore. Rept. by Secy., June 26. SEWERS.—None.

P 7. **COLLEGE HILL** (P. O., Beaver Falls), Beaver Co. (Not given.) College Hill Water Co. incorp. Jan., '97. Cap. stock, $20,000. Directors: W. H. Parington and Jno. R. Boole, College Hill; C. P. Wallace, Beaver Falls, and others.

299. **COLLINGDALE,** Delaware Co. See Swarthmore.

54. **COLUMBIA,** Lancaster Co. (10,599.) Built in '23-6 by Columbia Water Co. SUPPLY.—Susquehanna River and spring, by gravity and by pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; Worthington non-comp. non-cond. RESERVOIRS.—Cap., est., 5,000,000 galls.; two. DISTRIBUTION.—Mains, 13 miles. Taps, 1,900. Meters, 5. Hydrants, 90. FINANCIAL.—Cost, $150,000. Cap. Stock, $100,000; all paid-up; paid 6% div'd in '90-1. Bonded debt, $60,500, at 5%. Expenses, $8,525: Operating, $5,000; int., $3,025; taxes, $500. Revenue: Consumers, $17,500. NOTE.—No report since '90-1 Manual.

299. **COLWYN,** Delaware Co. See Swarthmore.

55. **CONEMAUGH,** Cambria Co. (Township, 764.) Built in '93-6 (?) by Conemaugh & Franklin Water Co. (Former borough of Conemaugh is now part of Johnstown and should not be confused with township.) The first contracts were let in '93. SUPPLY.—River. No further information could be obtained. FINANCIAL.—Est. cost, $30,000.

56. **CONNELLSVILLE,** Fayette Co. (5,629.) Now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. Built in '83 by Connellsville Water Co. FRANCHISE.—Provides for purchase of works by city in '98, price to be determined by arbitration. Maximum rates are fixed in franchise. SUPPLY.—Mountain springs and Youghiogheny River, by gravity and pumping. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000. Bituminous coal used. RESERVOIRS.—Cap., 20,000,000 galls.; 5,000,000 and 15,000,000. DISTRIBUTION.—Mains, 15 miles. Hydrants, 92. PRESSURE.—Ordinary and fire, 130 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg; Secy. and Treas., J. F. Cockburn; Supt., J. E. Stillwagon. Rept. by Am. W.-W. & G. Co., Pittsburg, Aug. 20, '96. REFERENCE.—Eng. News, Dec. 15, '83.

57. **CONSHOHOCKEN,** Montgomery Co. (5,470.) Built in '73 by Conshohocken Gas & Water Co. FRANCHISE.—Was 20 yrs. from '73; provided for purchase of works by city in '93; price to be cost of construction and 10% int. on same. Rates not subject to regulation by city. SUPPLY.—Schuylkill River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington; one non-cond., one comp. non-cond. Anthracite pea coal used; av. cost, $2.65 per short ton. RESERVOIRS.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 9½ miles; cost extensions met by income. Taps, 543; made by Co. for $2.50. Services, lead; paid for by property owner. Meters: 50; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for hotels and factories. Hydrants, public, 54; private, 3. CONSUMPTION.—(Galls.) av., 255,000. PRESSURE.—Ordinary, 10 to 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $110,000. Cap. Stock: Authorized, $100,000; paid-up, $75,000; paid 6% div'd in '95. Bonded debt, $15,500, at 4%; due 1908. Expenses, $3,463: Operating, $2,447; int., $620; taxes, $396. Revenue, $8,330: Consumers, $7,480; City, fire protection, $850. MANAGEMENT.—Prest., Jawood Lukens; Secy. and Treas., Alfred Crafts; Supt. and Ch. Pump. Engr., Wm. E. Farrier. SEWERS.—None. REFERENCE.—Eng. News, Oct. 8, '81.

58. **CONYNGHAM,** Luzerne Co. (1,299.) Present works built in '80 by Conyngham Water Co. About '30 water was introduced through logs by an association. FRANCHISE.—Perpetual. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 47,000 galls.; near springs. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by income and selling stock. Taps, 50; made by Co. for $1.75. Services, galv. 1.; paid for by owner. Hydrants, 6. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 60 to 120 lbs. No steam fire engines used. FINANCIAL.—Cap. Stock, $4,000; all paid-up; paid 9% div'd in '95. Debt, none. Expenses: Operating, $179;

taxes, $20. MANAGEMENT.—Prest., Chas. H. Knelly; Secy. and Treas., Saml. Benner; Supt., J. D. Getling. Rept. by Secy., June 15, '96. PROJECTED IMPROVEMENTS.—Increase in supply. SEWERS.—None.

P 8. **COOPERSBURG**, Lehigh Co. (454.) Projected by borough, but not very definite as yet. Supply, springs, by pumping. Rept. by a citizen.

140. **COOPERSDALE** (P. O., Johnstown), Cambria Co. (619.) See Johnstown.

59. **CORAOPOLIS**, Allegheny Co. (962.) Under construction '96-7 by borough. Engrs., Edeburn & Cooper, Pittsburg. Contrs., Chandly Bros. & Co., Beaver Falls. SUPPLY.—Filter crib in Ohio River, by pumping. FINANCIAL.—Contract price, $24,698. MANAGEMENT.—Chn., Jno. W. Arrat. Rept. by E. H. Ferrer, Town Clk., Nov. 9, '96.

60. **CORRY**, Erie Co. (5,677.) Built in '86 by Corry Water Co. FRANCHISE.—10 yrs. from Jan. 20, '86; provided for purchase of works by city in 10 yrs. Hydrant rental, $50 each per yr. LEGAL DIFFICULTIES.—See Note, below. SUPPLY.—Hare Creek, pumping from impounding to distributing reservoir. Press rept., Jan., '93, stated Co. had sunk 25 8-in wells about two miles from town and would abandon creek. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Holly comp. cond. RESERVOIRS.—Cap., 23,500,000 (?) galls.: Impounding, reported to be 20,000,000; distributing, 3,500,000. DISTRIBUTION.—Mains, 12½ miles. Taps, 385. Meters, 0. Hydrants, 62. FINANCIAL.—Cost (in '89), $300,000. Cap. Stock, $200,000; all paid-up. Bonded debt, $100,000, at 6%. Expenses, $10,500: Operating, $4,500; int., $6,000. Revenue, $10,021: Consumers, $6,921; City, fire protection, $3,100. NOTE.—Latest official rept. made Dec. 31, '91, by H. H. Bowly, who stated that works were being operated by Chas. E. Kimball; both of 45 Wall St., N. Y. City. In '95 city let contract for municipal works, but was restrained in local and State Supreme Court on the ground that it would exceed its debt limit.

61. **COUDERSPORT**, Potter Co. (1,530.) Built about '82 by Citizens' Water Co. SUPPLY.—Springs, by gravity. DISTRIBUTION.—Mains, 6 to 4-in. Hydrants, 46. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $24,000. Cap. Stock, $24,000. No debt. Revenue, $2,400: Consumers, $2,200; City, fire protection, $200. MANAGEMENT.—Secy., J. L. Knox; Treas., R. L. Nicholls. Rept. by Prest., A. G. Olmstead, Oct. 15, '96.

247. **CRAFTON**, Allegheny Co. (Not given.) Supply from Monongahela Water Co. See Pittsburg. Also rept. as supplied by St. Clair Water Co.

D 5. **CRESSON**, Cambria Co. (Est., 295.) Built in '96 by Cresson Water Co. Contr., M. C. Hite, Hollidaysburg. Supply, springs, by gravity from 1,500,000-gall. reservoir. Fiscal year closed June 1. Mains, 1½ miles. Taps, 20. Services, galv. i. Meters, 0. Hydrants, private, 2. Pressure, Ordinary, 60 lbs. Cap. Stock: Authorized, $5,000; all paid-up. Prest. and Treas., R. Devereaux; Secy., W. McAteer. Rept. by Prest., Aug. 6. No sewers.

299. **CRUMLYNNE**, Delaware Co. See Swarthmore.

62. **CURWENSVILLE**, Clearfield Co. (1,664.) Built in '90-1 by Kaftman Water Co. Engr., Jos. H. Young, 4618 Chester Ave., Philadelphia. SUPPLY.—Springs, by gravity to and from reservoirs and by pumping. PUMP.—Cap., 750,000 galls.; Worthington comp. non-cond. DISTRIBUTION.—Mains, 5½ miles. Taps, 75. Hydrants, 32. PRESSURE.—Ordinary, 140 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $55,000. Cap. Stock: Authorized, $35,000; all paid-up. Bonded debt, $30,000, at 6%. Revenue: City, fire protection, $700. NOTE.—No report since June, '91.

37. **CYNWYD**, Montgomery Co. See Bryn Mawr.

140. **DALE** (P. O. Johnstown), Cambria Co. See Johnstown.

D 6. **DALLAS**, Luzerne Co. (415.) Built in '93 by Dallas Water Co. Engr., Thos. Wright, Luzerne. Contractors, Coon, Mooney & Stroh, Kingston. FRANCHISE.—Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes; no public service rendered as yet. No legal difficulties. Supply, Large springs in sand, one mile above town, by gravity. Reservoirs, Cap., 60,000 galls.; two, at springs. Fiscal year closed Dec. 31, '95. Mains, 2 miles; cost extensions met by general fund. Taps, 65; made by Co. for $3.50. Services, c. i.; paid for by property owner. Meters, 0. Use of meters optional with Co. Cap. Stock: Authorized, $12,000; all paid-up. Bonded debt, $5,000, at 5%; due in '98 to 1900. No sinking fund. Expenses: Operating, none; int., $250; taxes (state), $25. Reveune: Consumers, unmetered, $500. Prest., John T. Phillips; Secy., Chas. D. Gregory; Treas. and Supt., John J. Ryman. Rept. by Prest., Dec. 5, '96. A new reservoir will be built for storage if an arrangement is made with city for fire protection.

63. **DALLASTOWN**, York Co. (779.) Under construction in '96 by Dallastown Water Co., which was incorp. Apr. 14, '96, started work May 1, and expected to complete plant Oct. 1. SUPPLY.—Springs, pumped to reservoir. FINANCIAL.—Est. cost, $10,000. Cap. Stock: Authorized, $12,000. MANAGEMENT.—Treas., J. Geery. Rept. by H. D. Kauffman, June 25, '96.

P 9. **DALTON**, Lackawanna Co. (Est., 227.) North Abington Water Co., incorp. May, '94. Proposed supply, wells, pumping to reservoir. Est. cost, $8,000. Rept. Nov. 5, '96, by F. M. Francis, Secy., who stated franchise was then for sale.

64. **DANVILLE,** Montour Co. (7,998.) Built in '73 by borough. SUPPLY.—North branch of Susquehanna River, pumping direct. In '96 filter gallery was abandoned and mechanical filters substituted. PUMPS.—Cap., 6,500,000 galls.: 3,000,000 comp. cond., and 2,000,000 comp. non-cond., Worthington; 1,500,000 Holly quadruplex. Anthracite pea coal used; av. cost, $1.33 per short ton. FILTERS.—Cap., 1,000,000 galls.; Jewell. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 12 miles. Taps, 1,400; made by plumbers, free. Services, lead and iron; paid for by owner. Meters: 3; owned, controlled and repaired by borough. Use of meters optional with borough. Hydrants, public, 106; private, 10. CONSUMPTION. — (Galls.) av., 1,000,000. PRESSURE. — Ordinary, 70 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $169,000. Bonded debt, $100,000, at 4%. Expenses, $9,000: Operating, $5,000; int., $4,000. MANAGEMENT.—Prest., R. K. Polk; Secy., M. G. Youngman; Supt., E. S. Miller. Rept. by Secy., June 15, '96. SEWERS.—None. REFERENCES.—Eng. News, Nov. 12, '81; Jewell filters, May 28, '96.

299. **DARBY,** Delaware Co. (2,972.) See Swarthmore. Municipal works projected early in '97.

65. **DAWSON,** Fayette Co. (668.) Under construction in '96 by borough; was to be completed Nov. 30. Engr., E. J. Taylor, McKeesport. SUPPLY.—Bored well. RESERVOIRS.—Cap., 100,000 galls.; brick-lined. DISTRIBUTION.—Mains, about 1 mile. FINANCIAL.—Est. cost, $5,000. MANAGEMENT.—Rept. by Chn. Water Com., D. J. Redding, Nov. 7, '96.

25. **DAYLESFORD** (P. O., Paoli), Chester Co. See Berwyn.

66. **DELANO,** Schuylkill Co. (1,362.) Built in '96 by Lehigh Valley R. R. Co. Mines dried up wells, so it was necessary to build works to supply houses and shops of Co. Engr., F. W. Gilcreast. Contr., Chas. F. King. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 31,000,000 galls.; 23,000,000 and 8,000,000. DISTRIBUTION.—Mains, 1¾ miles. Taps, 145; made by Co., free. Services, galv. i.; paid for by company (?). Meters, 0. Hydrants, 7. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 42 lbs. FINANCIAL.—Cost, $31,700. No charges to consumers, who are all employees living in houses owned by Co.; house rents have not been increased since works were built. MANAGEMENT.—L. V. R. R. Co. Rept. by F. W. Gilcreast, Div. Engr., Nov. 15, '96. SEWERS.—Has some storm sewers.

P 10. **DELTA,** York Co. (565.) Borough proposes to begin works early in '97. Supply, drilled wells, pumping to reservoir. Est. cost, $10,000 to $12,000. Rept. by Boro. Secy., Seth L. Kinsey, Dec. 19, '96. Press repts. state $12,000 of bonds were voted about Nov. 1.

25. **DEVON,** Chester Co. See Berwyn.

67. **DERRY STATION,** Westmoreland Co. (1,968.) Built in '88-9 by Derry Water Co. SUPPLY.—Two streams, by gravity from two impounding and distributing reservoirs. RESERVOIRS.—Cap., 5,800,000 galls.; 2,800,000 and 3,000,000. DISTRIBUTION.—Mains, 5½ miles. Taps, 160. Services, w. i., lead. Meters, 0. Hydrants, 28. CONSUMPTION.—(Galls.) av., 350,000. FINANCIAL.—Revenue, City, fire protection, $560. MANAGEMENT.—Prest., C. S. Sims; Treas., P. S. Janeway, Phila.; Mgr., Murray Forbes, Greensburg. NOTE.—No report since '90-1 Manual.

274, 275 or 276. **DICKSON CITY,** Lackawanna Co. (3,110.) Supplied from one of the Scranton Cos., under name of Dickson Water Co.

——?. **DILLSBURG,** York Co. (587.) See Boiling Springs.

337. **DORRANCETON,** Luzerne Co. (Not given.) See Spring Brook Water Supply Co., Wilkes-Barre.

68, 69. **DOWNINGTOWN,** Chester Co. (1,920.)

DOWNINGTOWN GAS & WATER CO.

Built in '71-4. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. LEGAL DIFFICULTIES.—See municipal works. Supply, springs, by gravity from reservoirs. Reservoirs, cap., about 8,000,000 galls.; three or more. Mains, 7 miles. Taps, 435. Meters, 0. Hydrants, 1. Pressure, ordinary, 32 lbs. First cost, $50,000. Expenses, $1,390: Operating, $900; int., $240; taxes, $250. Revenue: Consumers, $5,000. Prest., Frank Buck; Secy., L. Buck, Phila.; Supt., Jas. Hamilton. No report since '90-1 Manual. REFERENCE.—Eng. News, May 20, '82.

MUNICIPAL WORKS.

Built in '95 by borough; put in operation April 1. Engr., Jos. H. Johnson. Contrs., W. S. Whitney, Allentown, and Kay & Coon, Bellwood. Co. (see above) applied for injunction to prevent building of borough works; Court of Common Pleas sustained demurrer and dismissed bill Sept. 9, '95. In May, '96, higher court reversed above order and directed that the "record be remitted for further proceedings." Court apparently held that borough had originally granted an exclusive franchise, which shut out borough as well as Co. from building competing works. Meanwhile borough appears to continue to operate its works. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 2,500,000 galls.; storage. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 8¼ miles; cost extensions met by income. Taps, 400; made by plumbers for 75 cts. Services, lead and galv. i.; paid for by property owner. Hydrants, public, 17; private, 1. CONSUMPTION,

unknown. PRESSURE.—Ordinary, 35 to 45 lbs. One steam fire engine is used. FINANCIAL.—Cost, $33,000. Bonded debt, $33,000, at 4½%. Sinking Fund: $900 per year set aside for payment of bonds. Expenses, $2,285: Operating, $800; int., $1,485. Revenue: Consumers, $4,000. Deficits: Interest and sinking fund met by taxation; surplus of revenue used for borough purposes. MANAGEMENT.—Prest., I. A. Bicking; Secy., Thos. Halliday; Supt., Jas. Hamilton. Rept. by G. Miller, Member of Council, July 11, '96. SEWERS.—None.

70. **DOYLESTOWN,** Bucks Co. (2,519.) Built in '69 by borough. SUPPLY.—Springs, pumping to reservoir, and direct for fire purposes. Press rept., Nov., '92, stated artesian well had been sunk; later one, that 1,200 ft. of 6-in. vitrified pipe was being laid from a stream to reservoir. PUMPS.—Cap., 3,300,000 galls.; 1,500,000 Gaskill; 300,000 Worthington, and 1,500,000 Holly dup. Repts. by makers. RESERVOIR.—Cap., 530,000 galls.; 60 ft. diam × 25 ft. deep; press rept., Nov., '92, stated reservoir had been covered with tin roof. DISTRIBUTION.—Mains, 10 miles. Taps, 460. Hydrants, 45. CONSUMPTION.—(Galls.) av., 90,000. PRESSURE.—(In '89.) Ordinary, 73 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $37,654. Floating debt, $312, at 4%. Bonded debt, $35,000, at 4%; $1,000 due yearly. Expenses, $2,743: Operating, $1,343; int., $1,400. Revenue, $5,062. MANAGEMENT.—Committee of three Comrs., one elected every year. NOTE.—No rept. since '90-1 Manual.

71. **DUBOIS,** Clearfield Co. (6,149.) Built in '90 by U. S. Water Supply Co.; operated by Dubois City Water-Works Co. Press repts. state Co. has agreed to accept $61,500 for works; an election to be held Dec. 24, '96, to vote on buying works for above price was officially advertised in Nov. and Dec. FRANCHISE.—20 yrs. from '90. LEGAL DIFFICULTIES.—Lower court declared franchise forfeited, Dec. 5, '95. In July, '96, State Supreme Court reversed decision. It appears that Co. was limited by franchise to certain springs, and that yield proving insufficient borough refused to pay hydrant rental and secured annulment of franchise. Higher court stated case was one for amicable adjustment by reduction of rates or increased supply. SUPPLY.—Springs, by gravity, and deep wells, by pumping. Springs are about 7½ miles from city and water is piped from them to reservoir. PUMPS.—Cap., 2,000,000 galls.; two Buffalo, 1,500,000 and 500,000. Natural gas used; av. cost, $50 per month. RESERVOIR.—Cap., 2,000,000 galls.; depth, 10 ft.; on ridge 2.64 miles from point where supply main enters town, 282 ft. above lowest part of town. FISCAL YEAR CLOSED Nov., '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by income. Taps, 303; made by Co. Services, lead; paid for by owner. Meters: 43; owned, controlled and repaired by Co.; yearly rental, $1.80. Co. can compel use of meter and any consumer may have one. Hydrants, public, 48; private, 5. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,500,000; min., 500,000. PRESSURE.—Ordinary, 80 to 100 lbs.; fire, 100 lbs. Steam fire engines are used but not attached to hydrants. FINANCIAL.—Cost, $150,000. Cap. Stock: Pref'd, authorized, $125,000. Expenses: Operating, $8,000; taxes, $16. Revenue, $8,100: Consumers, unmetered, $4,200; metered, $2,000; City, fire protection, $1,680; public buildings, $20; other purposes, $200. MANAGEMENT.—Prest., Geo. P. Smith, North Tonawanda, N. Y.; Secy. and Treas., Henry B. Smith, Bay City, Mich.; Supt., Geo. B. Campbell. Rept. by Supt., July 20, '96. SEWERS.—Has sanitary sewers only.

F 1. **DUKE CENTRE,** McKean Co. (In '80, 2,068.) Built for fire protection. Supply pumped to 40,000-gall. tank, steam being furnished from the pumping station of the National Transit Co. Mains, 1.3. Hydrants, 13. No rept. since '89-90 Manual.

72. **DUNCANNON,** Perry Co. (1,074.) Built in '94 by Trout Run Water Co; put in operation Jan. 1, '95. FRANCHISE.—99 yrs. from '94; provides for purchase of works by city in ten yrs. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 600,000 galls.; distributing, 60 × 100 ft. When water was turned in reservoir leaked and it was found that cement bottom had cracked. Rept. as to leak by S. B. Sheller, Chf. Burgess, Dec. 21, '94. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4½ miles. Taps, 120; made by Co. for $5. Services, galv. i.; paid for by consumer. Meters: 7; owned, controlled and repaired by consumer. Use of meters optional with consumer; compulsory for hotels. Hydrants, 19. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Co., Aug. 12, '96. SEWERS.—None.

73. **DUNMORE,** Lackawanna Co. (8,315.) Built in '69-70 by Dunmore Gas & Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates, not subject to regulation by city. SUPPLY.—Surface water, by gravity. Press rept., Nov., '94, stated 1,300,000 reservoir was being built. DISTRIBUTION.—Mains, about 5 miles. Taps, 600. Meters, 2. Hydrants, 6. FINANCIAL.—Cost (In '87), $150,000. NOTE.—No rept. since '90-1 Manual.

74. **DUQUESNE,** Allegheny Co. (Est., 540.) Built in '96 by borough. Engr., Saml. A. Taylor, Wilkinsburg. Contrs., Chandly Bros. & Co., Beaver Falls. SUPPLY.—5 artesian wells, 12-in. diam.; river connections in case of fire or other emergencies, pumping to standpipe. PUMPS.—Cap., 3,000,000 galls.: 2—1,500,000 Worthington comp. cond. STANDPIPE.—Cap., 500,000 galls.; steel, 9-16 to ¼-in. thick, on masonry foundation, consisting of a 5-ft. circular wall, filled inside with broken stone and concrete. DISTRIBUTION.—Mains, 12 miles. Hydrants, public, 66; private, 1. No fire engines used. FINANCIAL.—Bonded debt, $75,000. MANAGEMENT.—Supt., R. W. Hunter; Ch. Pump. Engr., J. R. Bowers. Rept. by Supt., Sept. 5. SEWERS.—None.

337. **DURYEA,** Luzerne Co. (846.) See Spring Brook Water Supply Co., Wilkes-Barre.

P 11. **DUSHORE,** Sullivan Co. (783.) Works were under discussion in '96. Rept. by Boro. Secy., B. S. Collins, Sept. 2, '96.

75. **EAST BRADY,** Clarion Co. (1,228.) Owned by East Brady Water-Works Co. Domestic works built in '70 and '75 by J. M. Cunningham and J. Y. Foster; plants consolidated in '95. SUPPLY.—Springs, by gravity to reservoir; also Allegheny River in dry weather, by pumping. PUMPS.—Cap., 1,500,000 galls.; Cameron. Natural gas used as fuel. RESERVOIR.—Cap., 53,000 galls.; storage. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 3 miles; cost extensions met by income. Taps, 250; made by Co. Services, iron; paid for by consumer. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cap. Stock: Authorized, $5,000. MANAGEMENT.—Prest., J. M. Cunningham; Secy. and Supt., J. Y. Foster; Treas., J. W. Berwick. Rept. by Secy., June 8, '96. SEWERS.—None.

76. **EAST GREENVILLE,** Montgomery Co. (539.) Built in '95 by borough. Engr., H. Sands, Pottstown. Contr., O'Reilly & Nolan, Reading. SUPPLY.—Perkiomen Creek, by pumping. PUMPS.—Cap., 500,000 galls.; Barr. Anthracite pea coal used; av. cost $3 per short ton. STAND-PIPE.—Cap., 132,000 galls.; w. iron; 15 × 100 ft., on masonry foundation. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by taxation. Taps, 87; made by borough, free, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 0. Hydrants, 17. CONSUMPTION.—(Galls.) av., 10,000; max., 15,000; min., 7,000. PRESSURE.—Fire, 125 lbs. FINANCIAL.—Cost, $18,000. Debt, $16,500; floating, $1,500, at 5%; bonded, $16,000, at 4%, due 1925. Expenses: Operating, $450; int., $640; taxes, $64. Revenue, $725. Deficits met by general taxation. MANAGEMENT.—Prest., Isaac Randenbush; Secy. and Supt., F. M. Keller; Treas., Dr. H. Bobb; Ch. Pump. Engr., C. Schlicher. Rept. by Secy., Nov. 9, '96. SEWERS.—None.

172. **EAST MAUCH CHUNK,** Carbon Co. (2,772.) Supply from Mauch Chunk.

D 7, 77. **EASTON,** Northampton Co. (14,481.)

EASTON WATER CO.

Built in '18 by Co. SUPPLY.—Springs, by gravity (in '90). Mains, 1½ miles. Taps, 200. Meters, 1. Hydrants, public, 0. Cap. Stock, authorized and paid-up, $22,890. No debt. Expenses, operating, $400. Revenue: Consumers, unmetered, $2,200; City, none. No rept. since '90-1 Manual.

LEHIGH WATER CO.

Built in '54 by Lehigh Water Co. FRANCHISE.—Provides for purchase of works by city at any time, price to be cost of works and 6% interest from time of expenditure, less all dividends. Rates controlled by three comrs. elected by people. SUPPLY.—Lehigh and Delaware rivers, pumping through distributing mains to reservoir. PUMPS.—Cap., 5,000,000 galls.: 2,000,000 Corliss, 2,000,000 Worthington comp. cond. and a Cornish. RESERVOIRS.—Cap., 4,000,000 galls. A 9,000,000 gall. reservoir, 290 ft. above Delaware River, was rept. as to be built in '90. DISTRIBUTION.—Mains, 21 miles. Taps, 1,200. Meters, 46. Hydrants, 96. FINANCIAL.—Withheld. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, Nov. 25, '82.

78. **EAST PITTSBURG,** Allegheny Co. (Not given.) Now owned by East Pittsburg Water Co.; built in '90 by Turtle Creek Valley Water Co. Supplies Port Perry, Wall, East Pittsburg, Turtle Creek, Wilmerding and Pitcairn. Engr., J Schineller, Pittsburg, Pa. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Co. is exempt from local taxes. City to pay $50 per hydrant. No legal difficulties. SUPPLY.—Monongahela River, pumping to reservoir and tank. PUMPS.—Cap., 9,000,000 galls.: Worthington vert. trip. exp., 3,000,000; Wilson & Snyder, 3,000,000; Snow, 3,000,000. RESERVOIRS.—Cap., 4,000,000 galls.; at Port Perry. TANK.—Cap., 150,000 galls.; at Pitcairn, for high service. FISCAL YEAR CLOSED March 31, '96. DISTRIBUTION.—Mains, 17½ miles; cost extensions met by capital account. Taps, 570; made by Co. for $3. Services, lead; paid for by consumer. Meters, 200; owned and controlled by Co.; repairs paid by consumer. Co. can compel use of meter and any consumer may have one. Hydrants, public, 62; private, 40. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $342,000. Cap. Stock: Authorized, $200,000; paid-up, $180,000; paid 3% div'd in '95. Bonded debt, $150,000, at 6%, due 1920. Revenue, $38,706. MANAGEMENT.—Prest., Geo. Westinghouse, Jr.; Secy. and Supt., Jno. F. Miller; Mgr., J. R. McGinley; Ch. Pump. Engr., M. B. Scott. Rept. by Secy., June 10, '96. SEWERS.—Has sanitary sewers.

79. **EAST STROUDSBURG,** Monroe Co. (1,819.) Built in '89-90 by borough. SUPPLY.—Sambo Creek, by gravity, from impounding reservoirs. (Makers rept. a 1,000,000 Blake pump installed here.) RESERVOIRS.—Cap., 7,000,000 galls.; three impounding, 1,500,000, 2,000,000 and 3,500,000. FISCAL YEAR CLOSED April 1, '96. DISTRIBUTION.—Mains, 7 miles; cost extensions met by income. Taps, 450; made by borough free. Services, iron; paid for by owner. Meters, 8; owned, controlled and repaired by borough. Use of meters compulsory for large consumers. Hydrants, 35. PRESSURE.—Ordinary and fire, 86 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $44,000, at 5%, due

1907. Expenses: Operating $233; int., $2,200. Revenue, street sprinkling, $75. No deficits; income is $800 to $1,200 in excess of expenses. MANAGEMENT.—Council. Prest., Chas. E. Durfee; Secy., A. R. Brittain; Treas., W. C. Drake; Supt., F. R. Transue. Rept. by Secy., July 14, '96. SEWERS.—None.

80. **EAST TYRONE,** Blair Co. (435.) Built in '93 by East Tyrone Water Co. Engr. and Contr., E. B. Kay, Swarthmore. SUPPLY.—Spring Run, by gravity. RESERVOIR. —Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 50. Services, galv. 1. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $15,000; paid-up, $1,500. Bonded debt, $15,000, at 6%. Expenses: Operating, $1,000. MANAGEMENT.—Prest., A. A. Stevens; Secy., Treas. and Supt., G. L. Stevens. Rept. by E. B. Kay, March 2, '96. SEWERS.—Partially sewered. NOTE.—Feb. 23, '97 (since above was put in type), Prest. repts. Co. has been absorbed by Tyrone Gas & Water Co. See Tyrone.

342. **EAST YORK** (P. O., York), York Co. (Not given.) Supplied by the York Water Co. See York. Rept. by Jacob L. Kuehn, Supt., Jan., '97.

81. **EBENSBURGH,** Cambria Co. (1,202.) Built in '74 by borough. SUPPLY.—Artesian well, with auxiliary supply from creek, pumping to reservoir. Well, 5¾ ins. diam. and 1,000 ft. deep. New supply rept. as to be introduced in '91. PUMPS.—A 288,000-gall. Cameron, driven by wind engine, supplemented by 500,000 steam Worthington simple high pressure. RESERVOIR.—Cap., 150,000 galls.; 75 ft. above town. DISTRIBUTION.—Mains, 3 miles. Taps, 86. Meters, 6. Hydrants, 16. FINANCIAL.—Cost, $16,000. Bonded debt, $4,800. Expenses: Operating, $577; int., $192. Revenue, $1,647. MANAGEMENT.—Committee of two, appointed by borough council. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 25, '82.

82. **EDDYSTONE,** Delaware Co. (Est., 603.) Built in '95 by Eddystone Water Co.; put in operation in May. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. SUPPLY.—From Springfield Water Co. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5 miles. Taps, 26; made by Co. for $3.50. Services, lead and iron; paid for by consumer. Meters, 3; owned, controlled and repaired by Co.; yearly rental, 10% of cost. Use of meters optional with Co. Hydrants, 12. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., F. M. Brooke; Secy., H. Bayard Hodge; Treas., J. W. Hawley; Supt., W. E. Rowland. Rept. by Engrs., June 8, '96.

83. **EDENBURGH** (P. O., Knox), Clarion Co. (751.) Owned by borough since '82; built in '80 by Edenburgh Water Co. SUPPLY.—300-ft. well, pumping to tanks. TANK. —Cap., 40,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 30. Meters, 0. Hydrants, 5. CONSUMPTION.—(Galls.) av., 2,500. PRESSURE.—Ordinary, 65 to 75 lbs. FINANCIAL.—First cost, $2,000. No debt. Expenses, Operating, $200. MANAGEMENT.—Rept. by Mgr., S. D. Hill, Nov. 11, '96. SEWERS.—None.

338. **EDGEWOOD** (P. O., Pittsburg), Allegheny Co. (616.) Supply from Wilkinsburg.

F 12. **EDGEWORTH** (P. O., Sewickley?) Allegheny Co. (Est., 49.) Press rept. Dec. 26, '96, stated Edgeworth Water Co. proposes to develop supply from filter crib in river and use 350,000-gall. pump driven by gas engine, to lift water to reservoir.

337. **EDWARDSVILLE** (P. O.?) Luzerne Co. (?) (Not given.) See Spring Brook Water Supply Co., Wilkesbarre.

F 2. **ELDRED,** McKean Co. (1,050.) Built for fire protection. Supply, pumping from Allegheny River to 40,000-gall. tank. In '89 there were 2 miles of mains and 18 hydrants, with pressure of 110 lbs. No rept. since '90-1 Manual.

84. **ELIZABETH,** Allegheny Co. (1,804.) Built in '96 by Elizabeth Water Co.; put in operation May 1. Engr., C. M. Clay. Furnishes water to West Elizabeth and expects to supply Port Vue and to sell water to Reynoldton boro. after July 1, '97. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city at expiration of franchise. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes for 10 yrs. City to pay $35 per hydrant per annum. No legal difficulties. SUPPLY.—Monongahela River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon. Bituminous coal used. RESERVOIRS.—Cap., 1,250,000 galls.; distributing; near borough limits. DISTRIBUTION.—Mains, 5 miles. Taps, made by Co., free. Services, lead and iron; paid for by consumer. Meters, owned and repairs paid by consumer; controlled by Co. Use of meters optional with consumer. Hydrants, 30. PRESSURE.—Ordinary, 135 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Secy. and Treas., Jno. P. McIntyre, McKeesport; Supt., W. I. Daft. Rept. by Secy., July 8, '96. SEWERS.—Has sanitary and storm sewers.

85. **ELIZABETHTOWN,** Lancaster Co. (1,218.) Built in '96 by Elizabethtown Water Co; put in operation Dec. 1. Engr. and Contr., Edgar B. Kay, Lewistown. FRANCHISE.—20 yrs. from '94. City to pay $475 per yr. for public service. No legal difficulties. SUPPLY.—Well and springs, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; 2—250,000 triplex, driven by 2—13 HP. Otto gas engines. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 4½ miles. Taps, 100; made by Co. for $1. Services, galv. 1.; paid for by consumer. Use of meters optional with Co. Hydrants, 26. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $20,000; paid-up, $5,000. Bonded debt; will issue

$15,000 in bonds at 4½%. MANAGEMENT.—Prest., H. K. Blough; Secy., I. N. S. Will; Treas., N. G. Heisey; Supt. and Ch. Pump. Engr., D. B. Shirk. Rept by Secy., Jan. 15, '97. SEWERS.—Has partial sanitary and storm sewers.

86. **ELIZABETHVILLE,** Dauphin Co. (676.) Built in '89 by Elizabethville Water Co.; put in operation Jan. 1, '90. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.—Cap., 540,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 2 miles; cost extensions met by income and loans. Taps, 65; made by plumbers. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 20; private, 1. CONSUMPTION.—Unknown. FINANCIAL.—Cost, $13,800. Floating debt, $4,500, at 5%; bonded, $4,500, at 5%; due 1913. Expenses: Operating, $302; taxes, $64. Revenue: City, fire protection, $300. MANAGEMENT.—Prest., Jas. Miller; Secy., W. D. Frank; Treas., C. Romberger; Supt., W. R. Keifer. Rept. by Secy., Sept. 18. SEWERS.—None.

247. **ELLIOTT,** Allegheny Co. (Not given.) SUPPLY.—From Monongahela Water Co. See Pittsburg.

87, 88. **EMAUS,** Lehigh Co. (883.)

BOROUGH WORKS.

Built in '71. SUPPLY.—Springs on Lehigh Mountain, by gravity to and from reservoir. RESERVOIRS.—Cap., est., 300,000 galls.; two, ½ mile from, and 250 to 300 ft. above village. DISTRIBUTION.—Mains, 3 miles. Taps, 210. Meters, 0. Hydrants, 12. FINANCIAL.—Cost, $18,500. Bonded debt, $11,500 at 4%. Expenses, $515: Operating, $50; int., $465. Revenue, $801. MANAGEMENT.—Town Council. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, Nov. 8, '84.

MOUNTAIN WATER CO.

Built in '91 under perpetual franchise. No legal difficulties. SUPPLY.—Mountain springs, by gravity. RESERVOIR.—Cap., 100,000 galls. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by stock. Taps, 60; made by Co. for $1. Services, galv. i.; paid for by owner. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, 2. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $2,227. Cap. stock: authorized, $5,000; paid-up, $2,227; paid 7% div'd in '95. Expenses: Operating, $10; taxes, $9. Revenue, $158. MANAGEMENT.—Prest., H. G. Jobst; Secy., H. W. Jarrett; Treas., E. G. Jobst; Supt., Jos. S. Jobst. Rept. by Secy., June 11. SEWERS.—None.

89. **EMLENTON,** Venango Co. (1,126.) Built in '78 by Emlenton Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. City to pay $12.50 per hydrant per yr. SUPPLY.—Springs and river, by gravity and pumping to reservoir. PUMPS.—Worthington. RESERVOIR.—Cap., 325,000 galls. DISTRIBUTION.—Mains, 10 miles. Services, iron and lead. Hydrants, 20. FINANCIAL.—Cap. stock, $15,000. Revenue, city, fire protection, $250. MANAGEMENT.—Prest., C. C. Cooper; Secy and Supt., John A. Weller; Treas., J. J. Gosser.

90. **EMPORIUM,** Cameron Co. (2,147.) Built in '87-8 by Co. SUPPLY.—Mountain streams, pumping to reservoirs. PUMPS.—Cap., 80,000 galls.; Deane. RESERVOIRS.—Cap., 110,000 galls.: one 80,000, one 30,000. DISTRIBUTION.—Mains, 12 miles. Taps, 337; made by consumer, no fee. Hydrants, public, 32; private, 5. PRESSURE.—Ordinary, 70 to 120 lbs. FINANCIAL.—Cost, $60,000. MANAGEMENT.—Prest., G. A. Walsh; Secy., J. D. Logan; Treas., W. S. Walker; Supt., W. D. White. SEWERS.—Has sanitary sewers only.

P 13. **EMSWORTH,** Allegheny Co. (438.) Valley Water Co. incorp. Oct. 15, '96. Cap. stock, $1,000; paid in, $100. Treas., A. C. Shaw, Pittsburg.

91. **EPHRATA,** Lancaster Co. (Township, 4,776.) Built in '79 by Ephrata Water Co. LEGAL DIFFICULTIES.—In '94 an alleged franchise was granted Co. under which it was to give public service. Burgess vetoed franchise, but Co. made improvements. Court decided that franchise was void, because not legally passed and because no provision was made to pay for public service. (Press repts.) Later borough voted to build works, but court restrained it, because bond limit would be exceeded. SUPPLY.—Springs by gravity. Press rept. in '93 stated that two tunnels had been driven to secure more water, and that a 500,000-gall. reservoir would be built near old one. RESERVOIR.—(In '89.) Cap., 60,000 galls.; covered. DISTRIBUTION.—Mains (in '88), 1 mile. Meters, 0. FINANCIAL.—Cost, (in '88), $4,000. NOTE.—No rept. since '90-1 Manual. REFERENCES.—Eng. News, Jan. 24, '85.

92. **ERIE,** Erie Co. (40,634.) Present works built in '67-9 by city; first supplied in '40. SUPPLY.—Lake Erie, pumping through stand-pipe to reservoir. INTAKE PIPES.—Old: 51-in. c. i., laid in crib, 1,000 ft. into lake to 18 ft. of water. Latter part of '95 contracts were let for 60-in. c. i. intake pipe about 8,200 ft. long. Engr., Walter C. Brough, Toronto; Consult. Engr., Rudolph Hering, N. Y. City. Contrs.: For pipe, Addystone Pipe & Steel Co.; for pipe-laying, Thatcher & Breyman, Toledo. PUMPS.—Cap., 22,000,000 galls.; 2—2,500,000 Cornish Bull, 5,000,000 Gaskill hor. comp., 12,000,000 Worthington hor. comp. high duty. Bituminous slack coal used; av. cost, $1.22 per short ton. RESERVOIRS.—Cap., 36,000,000 galls.; storage, 2 miles from pumping station, with bottom 210 ft. above lake. STAND-PIPE.—251 ft. high, enclosed in masonry tower. FISCAL YEAR

CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 92½ miles; cost extensions met by income. Taps, 1,025; made by city. Services, galv. i. Meters, 152; owned, controlled and repaired by city. Use of meters compulsory for brewers, bottlers, livery stables and factories. Hydrants, 491. CONSUMPTION.—(Galls.) av., 5,426,000; max., 7,334,000; min., 4,667,000. PRESSURE.—(In '89.) 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,408,789. Expenses: Operating, $35,663. Revenue: Consumers, unmetered, $93,-178; metered, $23,749. MANAGEMENT.—Three Comrs. Prest., T. W. Shacklett; Secy. and Treas., Wm. Himrod. Rept. by Secy., July 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 20, '81; stand-pipe, Apr. 25, '95; intake, Dec. 5, '95, and Jan. 16, '96.

247. **ESPLEN,** (No P. O.) Allegheny Co. (Not given.) SUPPLY.—From Monongahela Water Co., Pittsburg.

93. **ETNA,** Allegheny Co. (3,767.) Built in '88 by Etna Water Co. Press reports state that people and Council voted to buy plant in latter part of '93 for $85,000. SUPPLY.—Allegheny River, pumping to tank and direct. In '91 mains of systems at Etna and Sharpsburgh were connected for use in case of emergency. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Smith & Valle dup. Force main (in '89), 10 and 12-in. c. i., 4,800 ft. long, rising 310 ft. Bituminous coal used. FILTER-CRIB.—Timber crib-work, 235 ft. from shore, 16 × 90 ft. Sunk 9 ft. below river bed, covered with 5 ft. stone, gravel and sand. TANK.—Cap., 270,000 galls.; w. i., 40 × 30 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 115. Meters, 0. Hydrants, 30. CONSUMPTION.—(Galls.) av., 72,000. FINANCIAL.—Cost, $50,000. Hydrant rental, $50 each. MANAGEMENT.—Prest., J. M. Fox; Supt., Frank Dale. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Filter crib, Eng. News, May 10, '94.

201. **EVERETT,** (No P. O.), Westmoreland Co. See Mt. Pleasant.

337. **EXETER,** Luzerne Co. (790.) See Spring Brook Water Supply Co., Wilkes Barre.

94. **FACTORYVILLE,** Wyoming Co. (577.) Built in '94 by Nokomis Water Co. Engr., E. A. Bartl, Scranton; Contrs., A. H. Coon & Sons, Kingston. SUPPLY.—Lake, by gravity. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 4 miles; cost extensions met by stock. Taps, 60; made by Co. for $1. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 16. CONSUMPTION.—Unlimited. PRESSURE.—Ordinary, 67 lbs. FINANCIAL.—Revenue: City, fire protection, $240. MANAGEMENT.—Prest., C. A. Sisk; Secy., W. N. Manchester; Treas. and Supt., Geo. T. Bailey. Rept. by Secy., July 14, '96. SEWERS.—None.

299. **FAIRVIEW,** Erie Co. (305.) See Swarthmore.

299. **FERNWOOD,** Delaware Co. (619.) See Swarthmore.

95. **FLEETWOOD,** Berks Co. (878.) Built in '93-4 by Fleetwood Water Co. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 800,000 galls. DISTRIBUTION.—Mains, 4½ miles. Services, w. i. FINANCIAL.—Cost, $30,000. Cap. stock, authorized, $30,000. Bonded debt, $5,000, at 5%. MANAGEMENT.—Prest. and Supt., Geo. B. Schaeffer; Secy., Dr. Levi Lantz; Treas., John B. Bertolet. Rept. by Co., Jan. 18, '97.

299. **FOLSOM,** Delaware Co. (Not given.) See Swarthmore.

96. **FOREST CITY,** Susquehanna Co. (2,319.) Built in '88 by Rock Cliff Water Co. SUPPLY.—(Press rept., Oct., '94.) Impounding reservoir on Brace Brook, by gravity. PUMP.—Cap., 1,000,000 galls.; Gordon. RESERVOIRS.—(Press rept., Oct., '94.) Impounding, 4,000,000; also distributing. DISTRIBUTION.—(Press rept., Jan., '95.) Mains, 8½ miles. MANAGEMENT.—(Press rept., Jan., '95.) Prest., W. A. May, Scranton; Secy., L. A. Patterson, Carbondale. NOTE.—No official rept. since '90-1 Manual.

194, 337. **FORTY FORT,** Luzerne Co. (1,031.) See Moosic and Spring Brook Water Supply Cos., Wilkes-Barre.

97. **FOXBURGH,** Clarion Co. (640.) Built in '77 by Foxburgh Water Works Co. SUPPLY.—Allegheny River, pumping to tanks. PUMP.—Cap., about 20,000 galls. TANKS.—Two, cap., 20,000 galls. each. DISTRIBUTION.—Mains, 2 miles. Hydrants, 17. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. M. Fox; Supt. and Engr., Frank B. Dale. Rept. by Engr., Sept., '96.

D 8. **FRACKVILLE,** Schuylkill Co. (2,520.) Built in '82 by Mountain City Water Co.; shut down for a few years, owing to successful claim of Ashland borough to prior water rights; put in operation again about '89 or '90 under the name of "Water Co., F. S. & John Haupt, Proprietors." Co. not exempt from local taxes. Supply, artesian wells, pumping direct and to reservoir. First supplied from Little Mahanoy Creek. Two windmills and one Blake steam pump. Anthracite pea coal used; av. cost, $2.25 per short ton. Reservoirs, cap., about 500,000 galls.; 50 ft. above average elevation of town. Mains, 2 miles; cost extensions met by income. Taps, 50; made by Co.; paid for by consumer. Services, galv. i.; paid for by consumer. Meters, 13, owned by consumers; use of meters optional with consumer. Hydrants, 0. Pressure, ordinary, 60 lbs. Cost (in '88), $20,000. No debt. Prest., F. S. Haupt; Secy., Jno. Haupt. Rept. June 6, '96. No sewers. See Eng. News, Aug. 16, '84; water-pipe problem, Mar 1, '94.

98. **FRANKLIN,** Venango Co. (6,221.) Built in '65 by Venango Water Co. FRANCHISE.—Rates not subject to regulation by city. Co. not exempt from local taxes. City to

pay $20 per hydrant. Contract renewed for 10 yrs. from '95. SUPPLY.—Springs and wells, pumping direct from impounding reservoir. PUMPS.—Cap., 1,500,000 galls.; 1,000,000 Worthington comp. non-cond.; 500,000 Blake. Natural gas used; av. cost, 10 cts. per 1,000 cu. ft. RESERVOIR.—Cap., 17,000,000 galls. Taps, made by Co. for $1. Services, galv. i.; paid for by owner. Meters, 0. Hydrants, public, 59; private, 3. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Steam fire engines are seldom used. FINANCIAL.—(In '90), first cost, $80,000. Cap. Stock, $130,000; all paid-up; paid 6% div'd in '90. Expenses: Operating, $3,876; int., $2,300. Revenue: Consumers, $15,980. MANAGEMENT.—Prest., W. J. Bleakley; Secy., H. W. Bostwick; Treas., Thos. Nesbitt; Supt., Jno. T. Hanna. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Apr. 28, '83.

D 9. **FREDERICKSBURG,** Lebanon Co. (612.) Built by Fredericksburg Water Co. for domestic use, under perpetual franchise from '86. Supply, well, pumping with 288,000-gall. Snow dup. steam pump to 106,600-gall. storage reservoir. Mains, 1.05 miles; cost extensions met by earnings. Taps, 43; made by Co. for 50 cts. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Pressure, 34 lbs. Cap. Stock, authorized, $7,000; paid-up, $6,850. Debt, $325, at 5%. Expenses: Operating, $58; int., $14; taxes, $1. Revenue, none. Prest., C. G. Beaver; Secy., J. M. Strohm; Treas., John Barto; Supt., Wm. Ulrich; Ch. Pump. Engr., Aaron Walmer. Rept. by Secy., Dec. 31, '96.

P 14. **FREEDOM,** Beaver Co. (704.) Borough hopes to build works in '97. Supply, filter-crib in Ohio River, pumping to reservoir. Rept. by Borough Engr., J. P. Leaf, Rochester, Aug. '96.

99. **FREELAND,** Luzerne Co. (1,730.) Built in '83 by Freeland Water Co. SUPPLY.—Artesian wells, pumping to reservoir and direct. PUMPS.—Cap., 1,350,000 galls.; Worthington, 500,000 and 350,000 simple high pressure and a second 500,000. RESERVOIR.—Cap., 300,000 galls. DISTRIBUTION.—Mains, 3.5 miles. Taps, 423. Meters, 0. Hydrants, 20. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary (in '89), 65 to 80 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $21,000; all paid-up. Paid 12% div'd in '90. Floating debt, $500 at 6%. Sinking Fund, $1,370. Expenses: Operating, $2,600. Revenue, $5,025: Consumers, $4,800; City, fire protection, $225. NOTE.—No rept. since '90-1 Manual.

100. **FREEPORT,** Armstrong Co. (1,637.) Built in '83-4 by Freeport Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Allegheny River, pumping to reservoir and tank. PUMPS.—Cap., 1,400,000 galls.; Worthington 1,000,000, Blake 400,000. Bituminous coal used; av. cost, $1.30 per short ton. FILTER-CRIB.—Timber, 7 ft. sq. × 7 ft. high, with top covered; sunk in bed of river; top 18-ins. below bed of river; water enters bottom and sides. RESERVOIR.—1,600,000 galls. TANK.—Cap., 1,600,000 galls.; cedar. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 4 miles. Taps, 400; made by Co., free. Services, iron; paid for by owner. Meters, 30; owned and repairs paid by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 32; private, 10. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost (in '88), $12,000. Cap. Stock: Authorized, $20,000; all paid-up. Floating debt, $9,000, at 5%; bonded, $10,000, at 6%. Sinking Fund, $1,500. MANAGEMENT.—Prest., H. M. Breckenridge; Secy., Treas. and Supt., G. B. Findley. Rept. by Secy., Nov., '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Jan. 31, '85.

101. **GALETON,** Potter Co. (720.) Built in '95 by Pike Mills Water Co. SUPPLY.—By gravity; pumping in case of fire or shortage of supply. PUMP.—Worthington. DISTRIBUTION.—Mains not given; cost extensions met by notes. Taps, 200; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 5. PRESSURE.—Ordinary, 75 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $22,000. Cap. Stock: Pref'd, authorized, $10,000. MANAGEMENT.—Prest., J. M. Carpenter; Secy., Edward Ansly. Rept. by Co., Sept. 2, '96. SEWERS.—None.

102. **GALLITZIN,** Cambria Co. (2,392.) Built by Co. for general supply. Engr., Paul Bracken. SUPPLY.—Pumped to reservoir. FINANCIAL.—Cost, about $22,000 (?). MANAGEMENT.—Mgr., F. J. C. Charisty. Rept. by J. J. Kinney, Sept. 8, '96.

D 10. **GERMANIA,** Potter Co. (638.) Built in '94 by Schwarzenbach Brewing Co. Engr. and Contr., R. Schwarzenbach. Co. is exempt from local taxes. No legal difficulties. Supply, springs, by gravity. Reservoir, Cap., 30,000 galls. Mains, 1½ miles. Services, iron; paid for by owner. Meters, 0. Hydrants, public, 0; private, 4. Consumption (galls.) av., 500; max., 1,000; min., 100. Pressure, 30 lbs. Expenses: Operating, $55; int., $30. Revenue, consumers, unmetered, $150. Rept. by Schwarzenbach Brewing Co., June 25, '96. Has sanitary sewers.

103. **GETTYSBURG,** Adams Co. (3,221.) Built in '46 by Gettysburg Water Co. New supply introduced in '94; put in operation June 1. Engr., W. H. Dechant, Reading. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. City to pay $400 a year for fire protection. No legal difficulties. SUPPLY.—Marsh Creek, pumping to reservoir. PUMP.—Cap., 500,000 galls.; Barr comp. dup. Bituminous coal used; av. cost, $3.50 per short ton. FILTERS.—Cap., 300,000

galls.; Warren. RESERVOIRS.—Cap., 800,000 galls.; distributing. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by stock. Taps, 450; made by consumer; no fee. Services, iron; paid for by consumer. Meters, not given; owned, controlled and repaired by Co.; yearly rental, $2. Use of meters optional with Co. Compulsory for hotels and factories. Hydrants, 35. CONSUMPTION.—(Galls.) av., 75,000; min., 50,000. PRESSURE.—Ordinary, 50 lbs. Steam fire engines are used. FINANCIAL.—Cost, $55,000. Cap. Stock: Authorized, $45,000; paid-up, $36,000; paid 6% div'd in '95. Bonded debt, $12,000, at 4%, due 1904. Expenses, $2,298: Operating, $1,500; int., $480; taxes, $318. Revenue, $4,100: Consumers, $3,700; City, fire protection, $400. MANAGEMENT.—Prest., Chas. M. McCurdy; Secy. and Treas., J. W. Kendlehart; Supt., R. Caldwell. Rept. by Prest., June 6, '96. PROJECTED IMPROVEMENTS.—Expenditure of $10,000 for fire protection in '96. SEWERS.—Has partial sanitary sewers.

104. **GILBERTON,** Schuylkill Co. (3,687.) Controlled by Philadelphia & Reading Coal & Iron Co. Built in '79 by Anthracite Water Co., principally to supply collieries and railroads and incidentally to supply Gilberton. SUPPLY.—Mud and Waste House Runs, by gravity from reservoirs. RESERVOIRS.—Cap., 140,000,000 galls. Mud Run, 80,000,000; area, 40 acres. Waste House, 60,000,000; area, 10 acres. DISTRIBUTION.—Taps, 225. Meters, 0. Hydrants, 25. FINANCIAL.—Cost, $150,000. No debt. Expenses, operating, about $1,000. MANAGEMENT.—Prest., R. C. Luther; Secy. and Treas., F. Carter; Supt., G. S. Clemens, all of Pottsville.

105, 106. **GIRARDVILLE,** Schuylkill Co. (3,584.)

GIRARD WATER CO.

Built in '81. SUPPLY.—Girard Water Co.'s works, see above. DISTRIBUTION.—the public in West Mahanoy Township and contiguous territory, chiefly to collieries, and also the water-works of the borough of Girardville. In '83, for self-protection, a charter was obtained under the name of Girard Water Co. The pipe line is still the property of the estate and is leased by the Co. at an ann. rental of $4,000. In '95 supplied in part towns of Ashland, Shenandoah and Mahanoy City. No legal difficulties. SUPPLY.—Lost Creek and Raven's Run, by gravity. RESERVOIRS.—Cap., 182,073,000 galls. Distributing, No. 1, 400,000; area, 0.25 acre; max. depth, 8 ft. Impounding, No. 2, 35,000,000; area, 8.5 acres; max. depth, 23 ft.; No. 3, 73,092,000; area, 18.3 acres; max. depth, 26 ft.; No. 4, 73,581,000; area, 21.9 acres; max. depth, 27.3 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 11 miles; cost extensions met by stock. Taps, 20. Meters, 15; owned, controlled and repaired by Co. CONSUMPTION.—(Galls.) av., 610,000. PRESSURE.—Ordinary, 150 lbs. FINANCIAL.—Cost, $201,645. Cap. Stock: Authorized, $200,000; all paid-up; paid 4% div'd in '95. Expenses, $18,294: Operating, $9,314; int., $7,980; taxes, $1,000. Revenue, consumers, $16,864. MANAGEMENT.—Prest., Genl. L. Wagner; Secy., Geo. E. Kirkpatrick; Treas., F. M. Highley; Supt., E. C. Wagner. Rept. by Supt., June 11, '96. SEWERS.—None.

BOROUGH WORKS.

Built in '81. SUPPLY.—Girard Water Co.'s works, see above. DISTRIBUTION.—Mains, 4 miles. Taps, 300. Hydrants, 30. FINANCIAL.—Cost, $16,000. Debt, $16,000, at 4%. Expenses, operating, $600. Revenue, consumers, $1,200. NOTE.—No rept. since '90-1 Manual.

204. **GLEN LYON,** Luzerne Co. (2,255.) See Nanticoke.

299. **GLENOLDEN,** Delaware Co. (396.) See Swarthmore.

135. **GLENSIDE,** Montgomery Co. Supply from Jenkinton.

107. **GORDON,** Schuylkill Co. (1,194.) Now owned by Citizens' Water Co. Built in '89 by Geo. W. Hadesty, as Hadesty Water Co. Press rept. states Citizens' Water Co. took possession in '94. FRANCHISE.—50 yrs. from '88. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Spring, by gravity. FISCAL YEAR CLOSED Nov. 30, '96. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income. Taps, 114; made for $3. Services, iron; paid for by consumer. Meters, 0. Hydrants, 5. PRESSURE.—Ordinary, 40 to 60 lbs.; fire, 100 to 120 lbs. FINANCIAL.—Cap. Stock: Authorized, $10,000; all paid-up. Bonded debt, $5,000, at 5%, due in 1915, payable after 1900. Sinking Fund, $800, invested in real estate mortgage at 6%. Expenses: Operating, $20; int., $250; taxes, $47. Revenue, consumers, $707. MANAGEMENT.—Prest., G. M. Hadesty; Secy. and Treas., W. S. Uhler. Rept. by Secy., Dec. 21, '96.

108. **GREAT BEND,** Susquehanna Co. (1,002.) Built by Co. in '94 (probably Great Bend Water Co., which was incorp. in '92). SUPPLY.—Lake, by gravity. Lake at "high elevation," 2½ miles distant. DISTRIBUTION.—Mains, 6 and 4-in. Hydrants, 14. MANAGEMENT.—Rept. by Secy., W. T. Estabrook, June, '94, when mains were being laid.

109. **GREENCASTLE,** Franklin Co. (1,525.) Built in '94 by Consumers' Water Co. Contr., Henry Birkinbine, Philadelphia. FRANCHISE.—(Press rept.) Hydrant rental, $15 each. SUPPLY.—Eshelman Spring, by gravity. FINANCIAL.—Authorized cap. stock at time of incorp., $30,000. Information from city clerk in '94 and from press repts.

110. **GREENSBURG,** Westmoreland Co. (4,202.) Built in '88 by Westmoreland Water Co. of Unity Township. Extended in '89 to supply Jeannette, Penn, Manor and Irwin. FRANCHISE.—Perpetual. State law provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. not exempt from local taxes. City to pay $50 per hydrant per annum. No legal difficulties. SUPPLY.—Mountain streams, from impounding reservoir to distributing reservoirs. RESERVOIRS.—Cap., 256,000,000 galls.; storage, 180,000,000 and 74,000,000; distributing, 2,000,000. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 49 miles; cost extensions met by capital account. Taps, 1,150; made by Co. Services, lead; paid for by owner. Meters, 878; owned, controlled and repaired by Co. Co. can compel use of meter and any consumer may have one. Hydrants, public, 97; private, 20. CONSUMPTION.—(Galls.) av., 1,250,000; max., 1,400,000; min., 1,000,000. PRESSURE.—Ordinary, 40 to 140 lbs. FINANCIAL.—Cost, $815,478. Cap. Stock: Common, authorized, $225,000; all paid-up. Pref'd, authorized, $75,000; all paid-up. 7% div'd guaranteed. Bonded debt, $450,000, at 6%. No sinking fund. MANAGEMENT.—V.-Prest., J. K. Russell, Derry; Secy., Treas. and Manager, Murray Forbes. Rept. by Secy., June 8, '96.

111. **GREENVILLE,** Mercer Co. (3,674.) Built in '85-7 by Greenville Water Co. FRANCHISE.—Rates not subject to regulation by city. SUPPLY.—Springs, by gravity and pumping. PUMPS.—Cap., 500,000 galls. RESERVOIR.—Cap., 8,000,000 galls. DISTRIBUTION.—(In '88.) Mains, 5 miles. Taps, 300. Meters, 0. Hydrants, 35. FINANCIAL.—(In '88.) Cost, $128,031. Cap. Stock, $84,000. Bonded debt, $42,000, at 6%. NOTE.—No rept. since '90-1 Manual.

P 15. **GROVE CITY,** Mercer Co. (1,160.) Grove City Water Co. incorp. Aug. 15, '95, with authorized cap. stock of $10,000. Proposed supply, drilled wells, pumping to tank or stand-pipe. Est. cost, $25,000. Prest., J. C. Keller. Rept. by Secy., W. J. Hassman, Nov. 10, '96, who then stated Co. was having difficulty in getting franchise and that work would probably be started about Apr., '97.

P 16. **HALIFAX,** Dauphin Co. (515.) Fall of '96 boro. authorized com. to contract for public service with some Co. at $300 per yr., but finally laid the matter over. Rept. by J. Kouch, Boro. Secy. Press rept., Feb. 8, '97, stated borough had just agreed to pay $300 per yr. for 18 hydrants to W. D. Boyer, of Scranton. Supply, wells and reservoir on hill. Contract for 10 yrs., after which boro. may buy works.

112. **HALLSTEAD,** Susquehanna Co. (1,167.) Built in '92 or '93 by Hallstead Water Co. Authorized cap. stock (in '92), $25,000. Treas. (in '92), Geo. M. Hallstead, Scranton.

113. **HAMBURGH,** Berks Co. (2,127.) Built in '89-90 by Windsor Water Co. FRANCHISE.—Perpetual. No legal difficulties. SUPPLY.—Mill Creek, by gravity from impounding and distributing reservoirs. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles, 8 to 4-in. Taps, made by plumbers for $2. Services, lead and galv. i.; paid for by consumer. Meters, 1; owned by consumer; controlled by Co. Use of meters optional with Co. Compulsory for powerhouses and factories. Hydrants, 25. CONSUMPTION.—(Galls.) av., 125,000; max., 150,000; min., 100,000. PRESSURE.—Ordinary, 145 to 150 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock: Authorized, $50,000. Bonded debt, $25,000, at 5%. Revenue, City, fire protection, $500. MANAGEMENT.—Prest., P. D. Wanner; Secy., S. A. Loose; Treas., W. M. Raubenhold; Supt., M. N. Moals. Repts. by Secy., July 13, '96; Prest., Jan. 17, '97. PROJECTED IMPROVEMENTS.—Artesian well under construction. SEWERS.—None.

337. **HANOVER** (P. O., Nanticoke?), Luzerne Co. (?) (Township, 2,579.) Supplied by Hanover Water Co., which is controlled by Spring Brook Water Supply Co.; see Wilkesbarre.

114, 115. **HANOVER,** York Co. (3,746.)

HANOVER WATER CO.

Built in '74. SUPPLY.—Mountain springs, by gravity from collecting reservoirs. RESERVOIRS.—Cap., 5,000,000 galls. Press rept. in '93 stated that 15,000,000-gall. reservoir was to be built. DISTRIBUTION.—Mains, 6 miles. Taps, 430. Meters, 9. Hydrants, 36. FINANCIAL.—Cost, $38,325. Cap. Stock: Common, authorized, $30,000; all paid-up; paid 8% div'd in '90. No debt. Expenses, operating, $2,056. Revenue, $3,895: Consumers, $3,715; City, fire protection, $180. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, June 10, '82.

CONSUMERS' WATER CO.

Built in '96. FRANCHISE.—City to pay $10 per yr. for 50 hydrants, balance $8 per yr. SUPPLY.—Springs, by pumping to reservoirs. PUMPS.—Cap., 650,000 galls.; water power, 350,000; steam, 300,000. (Makers rept. a 500,000 Deane dup. sold in '95 for waterworks at Hanover, not stating which plant.) FILTERS.—Cap., 500,000 galls.; sand. RESERVOIRS.—Cap., 20,000,000 galls. DISTRIBUTION.—Taps, 650; made by Co. for $5. Services, iron; paid for by Co. to curb. Meters, 20; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for factories. Hydrants, 70. PRESSURE.—Ordinary, 76 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $60,000; all paid-up. Bonded debt, $30,000, at 6%. MANAGEMENT.—Prest., Jno. S. Young; Secy., C. E. Mont; Treas., H. E. Young. Rept. by Treas., Nov. 21, '96. SEWERS.—None.

116. **HARFORD,** Susquehanna Co. (1,514.) Built in '96 by Harford Water-Works. SUPPLY.—Mountain stream, by gravity from impounding reservoir formed by dam, 100 rods from centre of village, 100 ft. elev. DISTRIBUTION.—Mains, ½ mile. Taps, 12; made by consumer; no fee. Services, iron. Meters, 0. Hydrants, not given. PRESSURE.—Ordinary, 40 lbs. All faucets are required to be shut off upon alarm of fire. FINANCIAL.—Cost, $600 to $700. MANAGEMENT.—Treas., E. E. Jones. Rept. by City Clerk, E. T. Tiffany.

117, 118. **HARRISBURG,** Dauphin Co. (39,685.)

CITY WORKS.

Built in '40. SUPPLY.—Susquehanna River, pumping to reservoir. Force main (in '89), 30-in., 9,600 ft. long, rising 200 ft. PUMPS.—Cap., 10,000,000 galls.; 2—2,500,000 Knowles and 2-2,500,000 local. Anthracite pea coal used; av. cost, $2.60 per short ton. RESERVOIRS. — Cap., 20,000,000 galls.; distributing. STAND-PIPE. — Cap., 30,000 galls.; 5 x 205 ft., inclosed in brick tower. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 40 miles; cost extension met by taxation. Taps, made by city for $3.25. Services, lead, galv. i.; paid for by owner. Meters, 2,700; owned, controlled and repaired by City. Use of meters compulsory for factories, livery stables, motors and public laundries; optional for other consumers. Hydrants, 700. CONSUMPTION.—(Galls.) av., 6,308,000. PRESSURE.—Ordinary, 45 to 80 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $310,700, at 6%; $418,500, at 4%. Expenses, $61,494: Operating, $26,112; int., $35,382. Revenue, $96,193. MANAGEMENT.—Prest., E. Mather; Secy., G. G. Kennedy. Rept. by Secy. July 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 2, '82.

McKEE WATER CO.

Built in '93; put in operation July 25. Engr., M. B. Cowden. FRANCHISE.—Rates same as Harrisburg city plant. No legal difficulties. SUPPLY.—Harrisburg works. FINANCIAL.—No debt. Pays 6% annually on stock. MANAGEMENT.—Rept. by Secy. and Treas., J. A. Herman, Dec. 3, '96.

119. **HASTINGS,** Cambria Co. (1,070.) Built in '91 by Hastings Water Co.; put in operation Dec. 3. Engr., J. C. Patterson. SUPPLY.—Stream, by gravity from impounding reservoir. FISCAL YEAR CLOSED Apr. 6, '96. DISTRIBUTION.—Mains, 2 miles. Taps, 76; made by Co., free. Services, 1-in.; paid for by consumer. Hydrants, private, 2. CONSUMPTION.—(Galls.) av., 7,500. PRESURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $6,000. Cap. Stock: Authorized, $5,000; all paid-up. Expenses: Operating, $200; taxes, $25. MANAGEMENT.—Prest., D. W. Holt, Phillipsburgh; Secy., Jas. H. Allport; Treas., H. J. Van Dusen. Rept. by Secy., Dec. 26, '96. SEWERS.—Has sanitary sewers only.

P 16½. **HATBORO,** Montgomery Co. (781.) Hatboro Water Co., incorp. Feb. 15, '97. Cap. stock, authorized, $15,000; paid-up, $1,500. Address Francis C. Smith.

37. **HAVERFORD,** Montgomery Co. (259.) Supply from Bryn Mawr.

P 17. **HAWLEY,** Wayne Co. (1,968.) Built by Hawley Water Co. for domestic supply in or prior to '91. Rept. from a citizen in '91.

120, 121. **HAZLETON,** Luzerne Co. (11,872.)

HAZLETON WATER CO.

Built in '60. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. LEGAL DIFFICULTIES.—Regarding insufficient supply and payment required in advance; both Cos. increased supply in '96. SUPPLY.—Springs, by gravity from collecting reservoir, with pumping as auxiliary. PUMPS.—Cap., 1,440,000 galls.; two. RESERVOIRS.—Cap., 25,000,000, five in number (?). FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 20 miles. Taps, 2,500. Services, lead, w. i. Hydrants, 30. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock Authorized, $200,000; all paid-up; paid 5% div'd in '89. No debt. Expenses, about $12,000. Revenue, City, $340. MANAGEMENT.—Prest., E. G. Wilbur; Secy. and Treas., T. M. Santee; Supt., David Clark. NOTE.—No rept. of financial and management since '90-1 Manual.

DIAMOND WATER CO.

Put in operation Jan. 1, '88. LEGAL DIFFICULTIES.—See other Co. above. SUPPLY.—Springs, pumping from impounding to distributing reservoir. PUMPS.—Cap., 750,000 galls.; Deane comp. dup. RESERVOIR.—Cap., 3,800,000 galls.; impounding, 3,000,000; distributing, 800,000. DISTRIBUTION.—Mains, not given; 8 to 3-in. Taps, 400. Hydrants, 26. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $40,000. Cap. Stock, $30,000; all paid-up. Bonded debt, $10,000, at 4%. Expenses: Operating, $1,500. Revenue, $4,000: Consumers, $3,663; City, $337. SEWERS.—City has combined system of sewers. NOTE.—No rept. since '90-1 Manual, except for legal difficulties and pressure. Some information for each plant given by Cy. Engr., A. B. Cellax, Sept. 21, '96.

135. **HEASICK,** (No P. O.), Montgomery Co. (Not given.) See Jenkintown.

P 18. **HELLERTOWN,** Northampton Co. (708.) Boro. talks of building works in '97, but has not obtained legislative authority. SUPPLY.—Spring, by gravity. Est. cost, $15,000. Engr., J. W. Folwell, Philadelphia.

122. **HOLLIDAYSBURG,** Blair Co. (2,975.) Built in '67 by borough. SUPPLY.—Roaring Run impounding reservoir and Gap. Run, by gravity. Water taken 3 miles from, 279 ft. above town (in '89). FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 21 miles; cost extensions met by income. Taps, 1,200. Hydrants, 47. CONSUMPTION.—(Galls.) av., 300,000. FINANCIAL.—Cost, $45,000. Bonded debt, $45,000, at 4½%. Expenses: Operating, $1,200. Revenue, $5,100. MANAGEMENT.—Three Comrs.; Prest., E. R. Baldridge; Secy., R. W. Smith; Supt., C. A. McFarland. Rept. by Secy., Oct. 17, '96. REFERENCE.—Eng. News, Dec. 24, '81.

299. **HOLMES,** Delaware Co.(300.) See Swarthmore.

123. **HOLMESBURG,** (P. O., Philadelphia.), Philadelphia Co. (Pop. included in Philadelphia.) Built in '87-8 by Holmesburg Water Co. FRANCHISE.—Provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Sandy Run, pumping from subsiding reservoir to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 1,000,000 Gaskill dup., and 1,000,000 Worthington comp. non-cond. (Rept. by makers.) RESERVOIR.—Cap., 1,500,000 galls. STAND-PIPE.—Cap., 100,000 galls. FISCAL YEAR CLOSED Sept. 15, '96. DISTRIBUTION.—Mains, 5½ miles. Taps, 136. Meters, 1. Hydrants, 31. CONSUMPTION.—(Galls.) av., 46,000. FINANCIAL.—Cap. Stock: Authorized, $50,000; all paid-up. No debt. Expenses: Operating, $2,374; taxes, $206. Revenue, $5,995: Consumers, $5,546; other purposes, $549. MANAGEMENT.—Prest., A. C. Shallcross; Secy. and Treas., B. W. Snyder; Mgr., F. M. Richert. Rept. by Secy., Sept. 30, '96.

124. **HOMESTEAD,** Allegheny Co. (7,911.) Built in '92 by borough. SUPPLY.—Monongahela River, pumping to reservoir. PUMPS.—Cap., 5,500,000 galls.; 3,000,000 Worthington comp. cond., 2,500,000 Wilson & Snyder. Bituminous coal used; av. cost, $1.10 per short ton. RESERVOIRS.—Cap., 2,500,000 galls.; 314 ft. above town. FISCAL YEAR CLOSED March 4, '96. DISTRIBUTION.—Mains, 9 miles. Taps, 700; made by borough for $3. Services, lead; paid for by consumer. Meters, 10; owned and repaired by consumer, controlled by borough; use optional with consumer. Hydrants, 107. CONSUMPTION.—(Galls.) av., 700,000; max, 800,000; min., 500,000. FINANCIAL.—Cost, $135,000. Expenses: Operating, $3,500. Revenue, $10,000. MANAGEMENT.—Comrs., Chn., P. F. Hanley; Supt., Elmer Hough, City Engr. Rept. by Chn., July 24, '96. PROJECTED IMPROVEMENTS.—Additional reservoir, new mains and filters. SEWERS.—Has sanitary and storm sewers.

125. **HONESDALE,** Wayne Co. (2,816.) Built in '68-75 by Honesdale Water Co. FRANCHISE.—Perpetual. Rates not subject to regulation by city. Co. not exempt from local taxes. No legal difficulties. SUPPLY.—Ponds, 5 miles distant, by gravity to and from reservoir. FISCAL YEAR CLOSED May, '96. DISTRIBUTION.—Mains, 12 miles. Taps, 500; made by plumbers for $2. Services, galv. i.; paid for by consumer. Meters, 5; owned, controlled and repaired by Co.; yearly rental, $0.60. Use of meters compulsory for factories. Co. cannot compel, but may prohibit use of meter. Hydrants, public, 4; private, 4. PRESSURE.—Ordinary, 65 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $50,000; all paid-up. Bonded debt, $20,000, at 7%, due '97; $60,000, at 5%, due 1925. Expenses, operating, $1,300. Revenue, $8,000. MANAGEMENT.—Prest., Jno. A. Mears, Scranton; Secy., J. A. Davis; Treas., H. C. Hand; Supt., R. M. Stocker. Rept. by Supt., Aug. 8, '96. SEWERS.—Has private sewers.

126. **HONEY BROOK,** Chester Co. (514.) Built in '96 by borough. Engr., H. Sands, Pottstown. Contrs., E. B. Kay and W. G. Fritz. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 1,300,000 galls.; storage. DISTRIBUTION.—Mains, 3 miles. Services, lead and iron; paid for by borough to curb. Meters, not given. Use of meters optional with consumer. Hydrants, 20. PRESSURE.—Ordinary, 48 lbs.; fire, 72 lbs. Steam fire engines are used. FINANCIAL.—Cost, $15,000. MANAGEMENT.—Prest., Jno. De Haven; Secy., M. P. Hagerson; Treas., Jno. Finger; Supt., H. Sands. Rept. by Supt., June 26, '96.

261. **HORATIO,** Jefferson Co. See Reynoldsville.

127. **HOUTZDALE,** Clearfield Co. (2,231.) Built by Houtzdale Water Co. SUPPLY.—Well, pumping to reservoir. PUMP.—Cap., 50,000 galls. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 250. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 3,000. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $19,600. Cap. Stock: Common, authorized, $12,000; all paid-up. Debt, $6,500, at 6%. Expenses: Operating, $2,000. Revenue: Consumers, $2,000; City, fire protection, $600. MANAGEMENT.—Prest., Julius Veibahn; Secy. and Supt., Jno. W. Mooney; Treas., Robert R. Fleming. Rept. by Supt., Jan. 20, '97.

128. **HOWARD,** Centre Co. (554.) Built in '94 by borough; put in operation Mar. 1, '94. No Engr. Contrs., Logan Machine Works, Bellefonte. SUPPLY.—Small stream and springs about 1¼ miles from borough, by gravity. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 2½ miles. Taps, 46; made by property owner; $2 is charged for connection when property is located on the opposite side of the street from the main; otherwise no fee. Services, paid for by owner. Meters, 0. Hydrants, public,

17. **PRESSURE.**—Ordinary, 70 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $7,000, at 5%; due Dec. 1, 1906. No sinking fund. Expenses: Operating, $250. Revenue: Consumers, $172. All expenses met by rentals and taxation. MANAGEMENT.—Council: Prest., J. L. De Haas; Secy., Z. T. Weirick; Treas., W. Weber. SEWERS.—None.

387. **HUGHESTOWN** (P. O., Pittston), Luzerne Co. (1,454.) See Spring Brook Water Supply Co., Wilkes-Barre.

129. **HUGHESVILLE,** Lycoming Co. (1,358.) Built in '91 by Hughesville Water Co. Hydrant rental, $30 each per yr. SUPPLY.—Wells, pumping to reservoir. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 4 miles. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, est., $26,000. Hydrant rental, $30 each. NOTE.—No rept. since '90-1 Manual.

130. **HUMMELSTOWN,** Dauphin Co. (1,486.) Built in '88 by Hummelstown Water Co.; run in connection with flouring mills. SUPPLY.—Swatara Creek, pumping to stand-pipe; filtered through gravel. PUMP.—Cap., 23,000 galls.; Raymond & Campbell. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. DISTRIBUTION.—Mains, 2½ miles. Taps, 104. Meters, 0. Hydrants, 22. FINANCIAL.—Cost, $30,000. Cap. Stock: Common, authorized, $45,000; paid-up, $22,500; paid no div'd in '90. Debt, $28,480; floating, $5,980, at 6%; bonded, $22,500, at 6%; due in '98. Expenses, $2,085: Operating, $50; int., $1,650; taxes, $385. Revenue, $1,705; Consumers, $1,075; City, fire protection, $630. NOTE.—No rept. since '90-1 Manual.

131. **HUNTINGDON,** Huntingdon Co. (5,729.) Built in '85-6 by Huntingdon Water Co. SUPPLY.—Standing Stone Creek, pumping to reservoir and direct. PUMP.—Cap., 1,000,000 galls.; Gordon. RESERVOIRS.—Cap., 5,400,000 galls.; 1,500,000 and 3,900,000. DISTRIBUTION.—12 miles. Taps, 600. Meters, 2. Hydrants, 42. CONSUMPTION.—(Galls.) av., 300,000. FINANCIAL.—Cost, $75,000. Bonded debt, $60,000, at 4%. Revenue: City, fire protection, $1,600. MANAGEMENT.—Secy. and Treas., H. Hinckley, Williamsport; Supt., D. W. Smith. Rept. by Supt., Oct. 29, '96. SEWERS.—Has sewers.

132. **HYNDMAN,** Bedford Co. (1,056.) Built in '92 by Hyndman Water Co. Put in operation July 1, '92. Engr., —— Whitestone, Everett. Contrs., Regan & Dunlap, Phila. FRANCHISE.—10 yrs. from '92; provides for purchase of works by city at end of 10 yrs. City to pay $600 per annum for 25 hydrants; contract independent of franchise. SUPPLY.—Mountain stream, by gravity. RESERVOIRS.—Cap., 100,000 galls.; 1¼ miles from town. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 4 miles. Taps, 200; made by Co., including service to curb. Services, iron; paid for by consumers from curb. Hydrants, 25. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $20,000; all paid-up. Bonded debt, $12,000, at 5%. Expenses: Int., $600. Revenue: Consumers, unmetered, $1,200; City, fire protection, $600; other purposes, $700. MANAGEMENT.—Prest. and Genl. Mgr., J. W. Madore; Secy., J. K. White; Treas., N. A. Blair. Rept. by Prest., Aug. 18, '96. PROJECTED IMPROVEMENTS.—Larger reservoir. SEWERS.—Has partial system of sanitary sewers.

133. **INDIANA AND WEST INDIANA,** Indiana Co. (Indiana, 1,963; West Indiana, 1,634.) Built in '87 by Clymer Water Co. SUPPLY.—Driven wells, pumping to tanks. PUMP.—Cameron. TANKS.—Cap., 125,000 galls. DISTRIBUTION.—Mains, 7 miles. Taps, 260. Services, galv. 1. Meters, 69. Hydrants, 65. FINANCIAL.—Cost, $40,000. Cap. Stock: Authorized, $40,000; all paid-up. Expenses: Operating, $3,500. Revenue, $6,500: Consumers, $4,825; City, fire protection, $1,675. MANAGEMENT.—Prest., Geo. W. Wood; Secy. and Supt., Hugh M. Bell; Treas., J. R. Dougherty, Jr.

247. **INGRAM,** Allegheny Co. (Not given.) Supply from Monongahela Water Co. See Pittsburg.

134. **IRWIN,** Westmoreland Co. (2,428.) Built in '89-90 by Irwin Water Co.; put in operation March 1. FRANCHISE.—Perpetual. Rates not subject to regulation by city. Co. not exempt from local taxes on its real estate. City to pay $50 per hydrant per yr. Press rept. states contract expired Aug., '96. No legal difficulties. SUPPLY.—Westmoreland Water Co., Greensburgh. RESERVOIRS.—Cap., 1,000,000 galls.; distributing. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by capital account. Taps, 267; made by Co.; fee varies with distance. Services, lead; paid for by owner. Meters: 130; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 26; private, 8. CONSUMPTION.—(Galls.) av., 200,000; max., 300,000; min., 100,000. PRESSURE.—Ordinary, 50 to 120 lbs. FINANCIAL.—Cost, $74,087. Cap. Stock: Common, authorized, $25,000; paid-up, $25,000. Floating debt, $2,402. Bonded, $44,000, at 6%; due 1909. MANAGEMENT.—Prest., Jno. F. Wolf; Secy., Treas. and Man., Murray Forbes, Greensburgh. Rept. by Secy., June 8, '96. SEWERS.—No sewers.

110. **JEANNETTE,** Westmoreland Co. (3,296.) Supply from Greensburg.

——? **JEDDO,** Luzerne Co. (358.) Built by a Co., which owns all the houses supplied.

135. **JENKINTOWN,** Montgomery Co. (1,609.) Built in '89 by Jenkintown Water Co.; also supplies Wyncote, Noble, Glenside and Heasick, small unincorp. places. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. City to pay $20 per year for first 15 hydrants; $15 for each additional one. SUPPLY.—Eight artesian wells, pumping to stand-pipe and tank. PUMPS.—Cap.,

900,000 galls.; Worthington comp. non-cond. Also Downie pumps for wells. Anthracite buckwheat coal used; av. cost, $2.40 per short ton. STAND-PIPE.—Cap., 317,000 galls.; steel, 30 x 60 ft. TANK.—Cap., 100,000 galls.; on 120-ft. iron tower. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by stock. Taps, 400; made by Co. for $7, including service to curb. Services, lead; paid for by owner. Meters: 100; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, 42. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 60 to 130 lbs. FINANCIAL.—Cost, $88,000. Cap. Stock: Authorized, $150,000. Expenses, $7,087. Revenue, $11,129. MANAGEMENT.—Prest., E. Satterthwaite; Secy. and Mgr., J. W. Ridpath; Treas., E. Everett; Ch. Pump. Engr., Edw. Gross. Rept. by Secy., June 5, '96. SEWERS.—None.

136. **JERMYN,** Lackawanna Co. (2,650.) First supplied in '84 by Jermyn Water Co. Jermyn Water Co. and Rush Brook Water Co. were consolidated in '94 under the name of Jermyn Rush Brook Water Co. The second Co. built works about '92. FRANCHISE.—Does not provide for purchase of works by city. Rates, not subject to regulation by city. City to pay $15 per hydrant per yr. LEGAL DIFFICULTIES.—Press repts. state borough took steps to build works in '96, but was enjoined. SUPPLY.—Aylesworth Creek and Rush Brook, by gravity. RESERVOIR.—Area, ½ acre; depth at dam, 8¼ ft. DISTRIBUTION.—Mains, 16 miles. Taps, 700. Meters, 4. Hydrants, 27. FINANCIAL.—Cost, $130,000. Cap. Stock, $95,000; all paid-up; paid 11% div'd in '90. Bonded debt, $35,000. Expenses, $2,000. Revenue, $9,000. MANAGEMENT.—Prest., J. D. Stocker; Secy. and Supt., W. S. Hutchings. Rept. by Secy., Sept. 30, '96.

137. **JERSEY SHORE,** Lycoming Co. (1,853.) Built in '84-5 by Jersey Shore Water Co. FRANCHISE.—Perpetual; provides for purchase of works by city every 10 yrs., by giving one year's notice; value to be appraised. Rates, not subject to regulation by city. No legal difficulties. SUPPLY.—Mountain stream, by gravity and pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Knowles comp. cond. A 750,000 Worthington also reported. Bituminous coal used; av. cost, $2.00 per short ton. RESERVOIRS.—Cap., 3,000,000 galls. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by income. Taps, 255; made by Co. for $1.50. Services, galv. i.; paid for by consumer. Meters, none; optional with consumer. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., 250,000; max., 300,000; min., 200,000. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $71,000. Cap. Stock: Authorized, $75,000; all paid-up. Bonded debt, $31,000, at 5%; due 1914. Expenses, $3,472: Operating, $1,700; int., $1,550; taxes, $222. Revenue, $4,500: Consumers, $2,900. City, fire protection, $1,600. MANAGEMENT.—Prest. and Supt., F. Trump; Secy. and Treas., H. C. Trump. Rept. by Secy., Aug. 12, '96. SEWERS.—None. REFERENCE.—Submerged pipe, Eng. News, Nov. 22, '94.

138. **JESSUP,** Lackawanna Co. (Not given.) Built in '93 by Olyphant Water Co. for general supply. Contrs., Burke Bros., Scranton. SUPPLY.—Creek, by gravity.

139. **JOHNSONBURG,** Elk Co. (1,280.) Built by Johnsonburg Water Co. for general use. SUPPPLY.—Powers Run, pumping to reservoir.

140. **JOHNSTOWN,** Cambria Co. (21,805.) Built in '67 by Johnstown Water Co. Supplies City of Johnstown, the boroughs of Morrellville, Dale, Westmont and Coopersdale; parts of Upper and Lower Yoder, West Taylor and Stony Creek Townships. In '90 Stony Creek Water Co., which built works in '88, sold property to Johnstown Water Co. and dissolved. FRANCHISE.—Perpetual. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Mountain streams, by gravity. RESERVOIRS.—Cap., 60,000,000 galls. Two dams impounding 15,000,000 galls.; three reservoirs, 50,000,000, 10,000,000 and 5,000,000. FISCAL YEAR CLOSED April 30, '96. DISTRIBUTION.—Mains, 88 miles. Taps, 3,600; made by Co. for $2. Services, lead; paid for by owner. Meters (in '90), 0. Hydrants, public, 105; private, 60. CONSUMPTION.—(Galls.) av., 6,000,000 (domestic). PRESSURE.—Ordinary, 65 lbs. Steam fire engines are used. FINANCIAL.—Cost, $840,000. Cap. Stock: Authorized, $375,000; all paid-up. Bonded debt, $150,000, at 4%; due 1905. MANAGEMENT.—Prest., Jas. McMillen; Secy., A. H. Walters; Treas., Jno. D. Roberts. Rept. by Secy., July 1, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 14, '88.

——? **JUNIATA BOROUGH** (P. O. Kipple), Blair Co. (Township, 684.) Contracts let Jan., '97, by boro. Boro. Engr., S. C. Corson, Altoona. Mains (projected in '96), 4 miles. Repts. by Engr.

141. **KANE,** McKean Co. (2,944.) Built in '87-8 by Spring Water Co. FRANCHISE.—900 yrs. from '87. City to pay $375 per yr. for 25 hydrants. No legal difficulties. SUPPLY.—Springs and driven wells, pumping to tanks. PUMPS.—Cap., galls.; 1—1,000,000 Worthington; one Snow. TANKS.—Two, cap., 60,000 galls.; wood; on trestle 30 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income and loans. Taps, 500; made by plumbers for $1. Services, galv. i; paid for by Co. to curb line. Meters: 18; owned by Co. and consumers; controlled by Co.; repairs paid by consumer. Use of meters compulsory for factories. Co. can compel use of meter and any consumer may have one. Hydrants, public, 23; private, 2. PRESSURE.—Ordinary, 30 to 50 lbs.; fire, 50 to 75 lbs. FINANCIAL.—Cost, $31,500. Cap. Stock: Authorized, $40,000; paid-up, $22,750; paid 6% div'd in '95. Floating debt, $7,000, at 6%. Expenses, $7,311: Operating, $6,872; int., $253; taxes, $186. Revenue, $9,194: Consumers, $8,819;

City, fire protection, $375. MANAGEMENT.—Prest., Thos. L. Kane; Secy., A. D. Clark; Treas., J. D. Kane; Supt., G. P. Weeks; Ch. Pump. Engr., M. Galvin. Rept. by Secy., July 14, '96. SEWERS.—Has sanitary sewers.

299. **KELLYVILLE,** Delaware Co. See Swarthmore.

142. **KENNETT SQUARE,** Chester Co. (1,826.) Bought by borough in '50. Built in '42 by Co. SUPPLY.—Surface water and spring, pumping to reservoir and stand-pipe. RESERVOIR.—Cap., 38,000 galls. STAND-PIPE.—Cap., 45,000 galls.; 16 × 30 ft. Press rept., latter part of '95, stated that 150,000-gall. stand-pipe was being added. DISTRIBUTION.—Mains, 5 miles. Hydrants, 19. FINANCIAL.—First cost, $30,000. NOTE.—No rept. since '90-1 Manual.

143, 337. **KINGSTON,** Luzerne Co. (2,381.) Built by Spring Brook Water Co.; now controlled by Spring Brook Water Supply Co.; see Wilkes-Barre. SUPPLY.—Spring Brook, by gravity. PRESSURE.—Ordinary (in '90), 120 lbs.

144. **KITTANNING,** Armstrong Co. (3,095.) Built in '71 by Kittanning Water Co. FRANCHISE.—99 yrs. from '89; provides for purchase of works by city 20 years after completion. No legal difficulties. SUPPLY.—Allegheny River, pumping to reservoir. PUMPS.—Cap., 2,750,000 galls.; 2,000,000 Worthington comp. cond.; 750,000 Epping, Carpenter & Co. Natural gas used. RESERVOIRS.—Cap., 3,000,000 galls.; one 1,250,000, one 1,750,000. FISCAL YEAR CLOSED Aug. 31, '95. DISTRIBUTION.—Mains, 9 miles; cost extensions met by income and capital stock. Taps, made by Co. for $3 and upwards. Services, lead; paid for by owner. Hydrants, public, 35; private, 1. CONSUMPTION.—(Galls.) av., 1,200,000; max., 1,400,000; min., 1,000,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Bonded debt, $19,500, at 5%. MANAGEMENT.—Prest., V. Neubert; Secy., Treas. and Supt., W. B. Meredith. Rept. by Secy., June 19, '96. SEWERS.—Has sanitary and storm sewers.

145. **KNOX,** Clarion Co. (Township, 888.) Built in '82 by borough. SUPPLY.—Wells, pumping to tanks. PUMP.—Cap., 2,000 galls. (?) TANKS.—Cap., 28,000 galls.; two: 20,000 and 8,000. DISTRIBUTION.—Mains, 1 mile. Taps, 36. Hydrants, 4. CONSUMPTION.—(Galls.) av., 8,500. FINANCIAL.—Cost, $2,000. Expenses: Operating, $300. Revenue: Consumers, unmetered, $300. NOTE.—No rept. since '90-1 Manual.

247. **KNOXVILLE,** Tioga Co. (679.) Supply from Monongahela Water Co. See Pittsburg.

146. **KUTZTOWN,** Berks Co. (1,595.) Built in '90 by Kutztown Water Co. SUPPLY.—Artesian well, pumping to reservoir. PUMP.—Cap., 1,000,000 galls. Dean comp. dup. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 5 miles. Services, w. i. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $25,000. Bonded debt, $25,000, at 5%. MANAGEMENT.—Prest., Dr. J. S. Trexler; Secy., Jas. Marx; Treas. and Supt., J. Danl. Sharidan. Rept. by Co., Jan. 18, '97.

D 11. **LACEYVILLE,** Wyoming Co. (635.) Built in '93 by Citizens' Water Co. Charter granted Oct. 23, '93. No engr. or contr. No legal difficulties. Supply, springs and brooks, by gravity from small reservoir. Fiscal year closed Nov. 1, '96. Taps, 48; made by consumer. Services, lead and iron; paid for by Co. Meters, 0. Hydrants, private, 2. Cost, $7,000. Cap. Stock: Authorized, $5,000; all paid-up. Floating debt, $1,300, at 6%. Expenses: Operating, $585. Revenue, consumers, $899. Prest., B. W. Edwards; Secy. and Treas., J. B. Edwards. Supt., J. Vandervort. Rept. by Secy., Dec. 28, '96. No sewers.

337. **LACKAWANNA TOWNSHIP** (P. O. Minooka ?) Lackawanna Co. (8,061.) See Spring Brook Water Supply Co., Wilkes-Barre.

226. **LA MOTT,** Montgomery Co. See Oak Lane.

147. **LANCASTER,** Lancaster Co. (32,011.) Built in '36 by city. SUPPLY.—Conestoga Creek, pumping through stand-pipe to reservoirs. PUMPS.—Cap., 21,000,000 galls. Worthington: 6,000,000 and 3,000,000 comp. cond.; 10,000,000 hor. comp. high duty. Anthracite pea coal used; av. cost, $2.54 per short ton. RESERVOIRS.—Cap., 5,000,000 galls. In '92-94 city built a 15,000,000-gall. reservoir, which proved defective before being put in use. STAND-PIPE.—Cap., 11,000 galls.; 5 × 75 ft. FISCAL YEAR CLOSED March, '96. DISTRIBUTION.—Mains, 50 miles, 24 to 4-in. Taps, 6,500; made by city for $2. Services, lead and galv. i.; paid for by owner. Meters, 125; owned and repaired by city and property owners; controlled by city. Use of meters compulsory for hotels, breweries, livery stables, elevators, etc. Co. can compel use of meters and any consumer may have one at his own expense. Hydrants, public, 561; private, 12. CONSUMPTION.—(Galls.) av., 5,700,000; max., 7,000,000; min., 5,400,000. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Expenses: Operating, $23,924. Revenue, $33,000: Consumers, unmetered, $73,000; metered, $10,000. MANAGEMENT.—Prest., E. S. Smeltz; Clerk, C. A. Villee; Treas., J. H. Rathfon; Supt., E. H. Frailey; Ch. Pump. Engr., J. B. Bair. Rept. by Supt., Nov. 24, '96. PROJECTED IMPROVEMENTS.—July 29, '96, S. M. Gray, Providence, reported on improvements, including filtration. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Oct. 28, '82; failure of reservoir, Oct. 25 and Dec. 6, '94.

148. **LANGHORNE,** Bucks Co. (727.) Built in '86 -7 by Langhorne Spring Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. Co. not exempt from local taxes. No legal difficulties. SUPPLY.—

Springs, pumping from collecting reservoir to elevated tank. PUMPS.—Cap., 1,600,000 galls. 1,000,000 Worthington comp. dup. and 600,000 Hall. RESERVOIR.—Cap., 100,000,000 galls. TANK.—Cap., 40,000 galls.; cedar; on stone tower, 23 ft. diam. at top, 70 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains (in '90), 4¼ miles; cost extensions met by income. Taps, 129; made by Co. for $5. Services paid for by owner. Meters, 2; owned, controlled and repaired by Co. Use of meters compulsory for hotels. Co. cannot compel use of meter, but any consumer may have one by agreement. Hydrants, 9. CONSUMPTION.—(Galls.) av., 40,000. FINANCIAL.—Cost, $43,756. Cap. Stock: Authorized, $40,000; paid-up, $39,000; paid 5% div'd. Floating debt, $3,000, at 5%. Expenses, operating, $1,741. Revenue, $4,292. Consumers, $4,134; City, fire protection, $108; street sprinkling, $50. MANAGEMENT.—Prest., Chas. Hill; Secy. and Treas., J. S. Wright, Eden; Supt., O. Johnson. Rept. by Secy., Aug. 24, '96. SEWERS.—None.

149. **LANSDALE,** Montgomery Co. (1,858.) Built in '72 by Landsdale Water Co. SUPPLY.—Artesian wells, pumping to tank. TANK.—(In '89) Cap., about 58,000 galls.; 10 × 100 ft. DISTRIBUTION.—Mains, 3.8 miles. Taps, 306. Hydrants, 21. FINANCIAL.—Cost, $24,091. Cap. Stock, $15,000; paid 6% div'd in '95. Bonded debt, $6,700. Expenses, $2,229: int., $366; taxes, $208. Revenue, $3,933. MANAGEMENT.—Prest., Wm. D. Heebner; Supt., T. T. Ridington. Rept. by Prest., Sept. 28, '96.

150. **LANSDOWNE,** Delaware Co. (875.) Owned since '90 by Lansdowne Water Co. First works built in '87 by Casper Pennock. SUPPLY.—Crum Creek, pumping to tanks. PUMPS.—Cap., 40,000 galls.; Smith & Vaile. TANKS.—Cap., 40,000 galls. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 5 miles. Taps (in '90), about 135. Meters, 7; owned and controlled by Co. Hydrants (in '90), 5. FINANCIAL.—Cost (in '90), $20,000. Cap. Stock: Authorized, $50,000; paid-up (in '90), $23,000. Revenue, $8,730: Consumers, $8,000; City, fire protection, $550; street sprinkling, $180. MANAGEMENT.—Prest., T. P. Street; Secy. and Treas., E. B. Lewis; Supt., D. D. Mullin. Rept. by Secy., Aug. 19, '96. SEWERS.—Has sanitary sewers only.

151. **LANSFORD,** Carbon Co. (4,004.) Built in '73 by Panther Creek Water Co.; reported in '96 to be owned by Lehigh Coal and Navigation Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Headwaters of Bear Creek, by gravity. RESERVOIRS.—Cap., 8,000,000 galls.; storage. DISTRIBUTION.—Mains, 8½ miles. Taps, 131. Services, iron; paid for by owner. Meters, 0. Hydrants, public, 9; private, 25. CONSUMPTION.—(Galls.) av., 525,600. PRESSURE.—Ordinary, 10 lbs. Steam fire engines are used. FINANCIAL.—(In '89.) Cost, $52,000. No debt. Op. exp., $500. Revenue, consumers, $3,000. MANAGEMENT.—Prest., Geo. Ruddle; Secy. and Treas., J. E. Lauer; Supt., W. D. Zehner; Ch. Pump. Engr., Robt. Young. Rept. by Supt., July 21, '96. NOTE.—No rept. since '90-1 Manual of financial. REFERENCE.—Eng. News, May 5, '83.

152. **LATROBE,** Westmoreland Co. (3,589.) Built in '86 by Latrobe Water Co. FRANCHISE.—City to pay $28.50 per hydrant per year. SUPPLY.—Loyalhanna Creek, pumping direct. In '89 water was drawn from infiltration well near creek. PUMPS.—Cap., 4,100,000 galls. 1,500,000 Gordon and 2—1,300,000 Wilson & Snyder. Bituminous slack used; av. cost, 90 cts. per short ton. DISTRIBUTION.—Mains, 12 miles. Taps (in '90), 400. Services, lead. Meters, 0. Hydrants, 58. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 80 lbs.; fire, 110 lbs. FINANCIAL.—Cap. Stock: Authorized, $150,000; all paid-up; paid no div'd in '90. Net income used for extensions. Debt, $41,000: Floating, $16,000, at 6%; bonded, $25,000, at 6%. Expenses, $6,603: Operating, $4,114; int., $2,254; taxes, $235. Revenue, $12,365: Consumers, $10,245; City, fire protection, $1,920; other purposes, $200. MANAGEMENT.—Prest., H. S. Donnelly; Secy. and Treas., W. A. Johnston; Supt., Jas. Framy. Rept. by Secy., July 20, '96. SEWERS.—None. NOTE.—No rept. of financial since '90-1 Manual.

153. **LEBANON,** Lebanon Co. (14,664.) Built in '72 by borough. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.—Cap., 75,000,000 galls. 3 storage: 35,000,000; area, 4¼ acres; 22,000,000; area, 8¼ acres; 18,000,000; area, 4 acres. Press repts. state that one of the dams has leaked. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 22 miles; cost extensions met by revenue from rentals. Taps, 3,000; made for $2. Services, lead and iron; paid for by consumer. Meters, 83; owned, controlled and repaired by city. Use of meters compulsory for all but private families. City can compel use of meters and any consumer may have one. Hydrants, 115. CONSUMPTION.—(Galls.) av., 1,100,000. PRESSURE.—Ordinary, 45 lbs. Steam fire engines are used. FINANCIAL.—Cost, about $300,000. Bonded debt, $170,000, at 4%. Sinking Fund, $20,000. Revenue, $20,000: Consumers, unmetered, $16,500; metered, $3,500. MANAGEMENT.—Prest., Dr. J. K. Beckley; Secy., J. D. Kerr; Supt., R. J. Shirk. Rept. by Secy., Dec. 21, '96. PROJECTED IMPROVEMENTS.—Increasing supply to 2,000,000 galls. per day. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Feb. 11, '82.

154. **LEECHBURGH,** Armstrong Co. (1,921.) Built in '89 by Leechburgh Water-Works Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. Co. is exempt from local taxes. City to pay $500 per year for fire protection. No legal difficulties. SUPPLY.—Kiskaminetas River, pumping to tanks. PUMPS.—Cap., 300,000 galls.; Smith & Vaile dup. Bituminous coal used; av. cost, $1.40 per short ton. TANKS.—Three, about 60,000 galls. FISCAL YEAR CLOSED May 1.

DISTRIBUTION.—Mains, 9 miles; cost extensions met by income. Taps, 300; made by Co., including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 35; owned and repaired by consumer; controlled by Co. Use of meters optional with Co. Hydrants, public, 27; private, 1. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 100 to 155 lbs. FINANCIAL.—Cost, $21,000. Cap. Stock: Authorized, $15,000; all paid-up. Bonded debt, $7,500, at 6%. Expenses: Int., $450; taxes, $103. Revenue, $3,450: Consumers, unmetered, $2,700; metered, $250; City, fire protection, $500. MANAGEMENT.—Prest., C. Campbell; Treas., D. M. Campbell; Supt., J. S. Patterson. Rept. by Co., July 13, '96. SEWERS.—None.

155. **LEHIGHTON,** Carbon Co. (2,959.) Built in '89 by Lehighton Water Co. Has supplied Weisport since '94, under name Weisport Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. LEGAL DIFFICULTIES.—About hydrant rental. Rates reduced from $25 to $15 per hydrant per yr. from Jan. 1, '96. SUPPLY.—Mountain stream, by gravity to reservoir. RESERVOIRS.—Cap., 6,000,000 galls.: Impounding, 2,000,000; storage, 3,500,000; distributing, 500,000. DISTRIBUTION.—Mains, 14 miles; cost extensions met by increase of stock. Taps, 400; made by Co. Services, lead; paid for by consumer. Meters, 3; owned, controlled and repaired by Co. Use of meters compulsory for railroads and large consumers. Hydrants, 46. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $106,275. Cap. Stock: Authorized, $50,000; all paid-up; paid 6% div'd in '95. Bonded debt, $25,000, at 5%, due 1900. Expenses, $4,857: Operating, $3,450; int., $1,250; taxes, $157. Revenue, $5,264: Consumers, unmetered, $4,538; metered, $36; City, fire protection, $690. MANAGEMENT.—Prest., Wm. E. Ash; Secy. and Supt., H. Seaboldt; Treas., D. H. Straup. Rept. by Secy., June 6, '96. SEWERS.—None.

156. **LEWISBURG,** Union Co. (3,248.) Built in '83 by Lewisburg Water Co. FRANCHISE.—Perpetual. SUPPLY.—West branch of Susquehanna River, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Knowles comp. dup.. Anthracite buckwheat coal used; av. cost, $1.55 per short ton. STAND-PIPE.—Cap., 110,000 galls.; 12 x 130 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (in '90), 5 miles. Taps, 340; made by plumbers for $1. Services, galv. i.; paid for by owner. Meters, 3; owned and controlled by Co. Hydrants, public, 45; private, 2. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $39,529. Cap. Stock: Authorized, $32,000; paid-up, $31,240; paid 5% div'd in '95. Sinking Fund, $2,500, invested at 5%. Expenses, operating, $2,009. Revenue: Consumers, $5,235; City, fire protection, $800. MANAGEMENT.—Prest., J. T. Baker; Secy. and Treas., Alfred Hayes; Supt., Wm. Jones; Ch. Pump. Engr., T. E. Irland. Rept. by Secy., June 13, '96. PROJECTED IMPROVEMENTS.—Additional stand-pipe. SEWERS.—Has parital sanitary sewers. REFERENCE.—Eng. News, June 7, '84.

157. **LEWISTOWN,** Mifflin Co. (3,273.) Built in '35 by Lewistown Water Co.; rebuilt in '96. Engr. and Contr., E. B. Kay, Bellwood. FRANCHISE.—Perpetual; provides for purchase of works by city. Co. is exempt from local taxes. City to pay $25 per hydrant per yr. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 1,000,000 galls.; storage. FISCAL YEAR CLOSED Feb., '96. DISTRIBUTION.—Mains, 10 miles; cost extensions met by cap. stock and bonds. Taps, 400; made by Co. Services, lead and galv. i.; paid for by consumer. Meters, 0. Use of meter optional with consumer. Hydrants, 30. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $80,000. Cap. Stock: Authorized, $25,000; all paid-up; paid 6% div'd in '95. Bonded debt, $50,000, at 5%, due after 5 yrs. Expenses, $3,775: Operating, $800; int., $2,750; taxes, $225. Revenue: Consumers, $5,500; City, fire protection, $750. MANAGEMENT.—Prest., S. B. Weber; Secy., T. F. McCoy; Treas., Geo. L. Russell; Mgr., Chas. A. Zerbe. Rept. by Mgr., Nov. 30, '96. SEWERS.—Partial private system of sanitary sewers.

315. **LEWISVILLE,** Potter Co. (459.) P. O. Ulysses, which see.

P 19. **LIGONIER,** Westmoreland Co. (782.) Projected by borough. Engr., L. W. Fogg, Latrobe. Supply, stream, by gravity. Est. cost, $20,000. Rept. by J. B. Peterson, Nov. 6, '96. Press rept., Feb. 24, '97, stated people had just voted to build, and that construction would begin in Apr.

158. **LINESVILLE,** Crawford Co. (552.) Built in '96 by Bunday Water Co. (not incorp.) for general supply. Engr., F. E. Bunday. SUPPLY.—Springs, by gravity from reservoir.

159. **LITITZ,** Lancaster Co. (1,494.) Built in '93 by Lititz Water Co. In '87 Co. built works for fire protection and street sprinkling. FRANCHISE.—10 yrs. from '93. SUPPLY.—Well, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Snow. Anthracite coal used; av. cost, $3.00 per short ton. STAND-PIPE.—Cap., 150,000 galls.; 16 x 100 ft. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by income. Taps, 81; made by Co. for $2. Services, lead and iron; paid for by consumer. Meters, 0. Hydrants, 30. CONSUMPTION.—(Galls.) av., 7,500. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $25,000. Cap Stock: Authorized, $25,000; all paid-up. Revenue: City, fire protection, $500. MANAGEMENT.—Prest., D. E. Light; Secy., A. R. Bomberger; Treas., A. B. Long; Supt., B. B. Hertsler. Rept. by Secy., Aug. 10, '96.

P 20. **LITTLESTOWN,** Adams Co. (991.) Town has let contract for well and voted

$15,000 of bonds. Expects to build works if well is successful, pumping water to standpipe. Engr., E. M. Kenly, Baltimore, Md. Rept. by Abia Smucker, Secy. Town Council, Jan. 30, '97.

299. **LLANERCH,** (P. O. Fernwood), Delaware Co. See Swarthmore.

299. **LLANWELLYN,** Delaware Co. (300.) See Swarthmore.

160. **LOCK HAVEN,** Clinton Co. (7,358.) Built in '09 by town. SUPPLY.—Two mountain streams, by gravity from impounding reservoirs on each. Drainage area, 15 sq. miles. In '93, Voorhees & Witmer, Buffalo, recommended 12-in. c. i. supply main 5½ miles long, to bring in new supply. A new supply was introduced with above firm as Engrs., probably in accordance with above recommendation. RESERVOIRS.—Cap., 6,000,000 galls.; two; 183 ft. above city. Dams failed May 30, '89. DISTRIBUTION.—Mains, 15 miles. Taps, 750. Services, galv. i. Hydrants, 80. FINANCIAL.—Cost, $130,000. Bonded debt, $114,000. Expenses: Operating, $1,400. Revenue, $10,000. NOTE.—No rept. since '90-1 Manual, and none since '88 for distribution and financial. REFERENCE.—Eng. News, June 3, '82.

D 12. **LOCUST GAP,** Northumberland Co. (1,598.) Built in '91 by Bear Gap Water Co. Rates are not subject to regulation by city. Supply, Roaring Creek, pumping to reservoir. Pump, cap., 4,600,000 galls.; 2—2,300,000 Worthington comp. cond. Anthracite pea coal used; av. cost, $1.75 per short ton. Reservoirs, cap., 6,250,000 galls.: Impounding, on Roaring Creek, 5,000,000; distributing, 1,250,000. Mains, 12 miles. Taps made by Co. for $2. Services paid for by consumer. Meters, 22; owned by Co. and consumer; controlled and repaired by Co. Use of meters compulsory for all services. Consumption, (Galls.) av., 1,000,000. Pressure, ordinary, 150 lbs. Cost, $235,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $100,000, at 5%, due 1921. Prest., W. C. McConnell; Secy., G. O. Martz; Treas., C. D. Williams, Shamokin. Rept. by Treas., June 16, '96. No sewers.

D 13. **LOCUST MOUNTAIN WATER CO.'S PLANT,** Columbia Co. (Address Centralia.) Built in '82-4 to supply Mt. Carmel and Centralia in dry season, Ry. Cos. and collieries. Supply, Roaring Creek, pumping to reservoir. Pumps, cap., 4,800,000 galls.; two 2,400,000 Worthington comp. Reservoir, cap., 2,000,000 galls. Mains, 15 miles. Taps, 15. Meters, 15. No report since '88 Manual.

337. **LUZERNE,** Luzerne Co. (2,398.) Supplied by Luzerne Water Co., which is controlled by Spring Brook Water Co.; see Wilkes-Barre.

161. **LYKENS,** Dauphin Co. (2,450.) Built in '85 by Lykens Water Co. Also supplies Wiconisco. SUPPLY.—Rattling Creek, by gravity. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains (in '90), 2.75 miles. Taps made by Co. for $2. Services, galv. i.; paid for by consumer. Hydrants, 26. FINANCIAL.—Cap. Stock: Authorized, $35,000. Expenses, small. MANAGEMENT.—Prest., I. J. Wistar; Secy., G. H. Ross; Treas., A. Haviland, all of Philadelphia; Supt., T. M. Williams. Rept. by Supt. SEWERS.—None.

D 14. **LYON STATION,** Berks Co. (472.) Built in '65 by Lyon Water Co. Supply, springs, by gravity to and from reservoir. Meters, 0. Co. cannot compel the use of meters. Cap. Stock: Pref'd, authorized, $5,000; paid-up, $3,600; 6% div'd guaranteed. Prest., Amos Rapp; Secy., Moses Kutz; Treas., Benj. Helfrich; Supt., Ged. Hartman. Rept. by Moses Kutz, Aug. 12, '96. No sewers.

162. **M'DONALD,** Washington Co. (1,698.) Built in '94 by Citizens' Water Co.; put in operation Jan. 19, '95. Engrs., Potter & Folwell, New York. Engr. (in charge construction?), Fred. Minshall, Piedmont, W. Va. Contrs., Cronin & O'Herron, Pittsburg. FRANCHISE.—30 yrs. from '95. Provides for purchase of works by city every 10 yrs. Rates fixed in franchise, not subject to regulation by city. City to pay $1,000 per yr. for 40 hydrants and $20 for each additional one. No legal difficulties. SUPPLY.—Raccoon Creek and artesian wells, pumping to tank. PUMPS.—Cap., 1,500,000 galls.; two Snow comp. cond. dup. Force main, 38,000 ft. 10-in. pipe. Bituminous coal used; av. cost, $1.60 per short ton. RESERVOIRS.—Cap., 133,000 galls. TANK.—Cap., 600,000 galls.; 60 × 30 ft. FISCAL YEAR CLOSED April 1, '96. DISTRIBUTION.—Mains, about 7 miles. Taps, 176; made by Co. free. Services, lead; paid for by consumer. Meters, 6; owned and repaired by consumer; controlled by Co. Use of meters compulsory for coal works, laundries, motors, etc. Co can compel use of meters and any consumer may have one. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary and fire, 105 lbs. FINANCIAL.—Cost, $76,277. Cap. Stock: Authorized, $75,000; paid-up, $35,600; paid 4% div'd in '95. Debt, floating, $46,700, at 6%. Bonds: Authorized, $50,000; none issued. Expenses: Operating, $2,989; int., $2,413; taxes, $150. Revenue, $7,534: Consumers, $5,205; City, fire protection, $1,020. MANAGEMENT.—Prest., C. R. Buckheit; Secy., Treas. and Supt., E. S. McWreath. Rept. by Secy., June 25, '96, and Supt., Jan. 18, '97. SEWERS.—None.

163. **M'KEESPORT,** Allegheny Co. (20,741.) Built in '81-2 by city. SUPPLY.—Youghiogheny River, pumping to reservoir. PUMPS.—Cap., 11,000,000 galls.; 5,000,000 Wilson & Snyder; 2—3,000,000 Blake. In '96 contract was let for 2—4,000,000 comp. noncond. Worthington. Also 2—1,500,000 simple high pressure Worthington for high service. Bituminous slack coal used; av. cost, 65 cts. per short ton. RESERVOIR.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 29¾ miles; cost

extensions met by income. Taps, 3,101; made by city, free. Services, lead; paid for by city to curb line. Meters, 470; owned by consumer; controlled and repairs paid by city; yearly rental 15% of cost. Co. can compel use of meters and any consumer may have one. Hydrants, public, 207. CONSUMPTION.—(Galls.) av., 4,000,000; max., 5,300,000; min., 3,200,000. PRESSURE.—Ordinary, 20 to 120 lbs. FINANCIAL.—Cost, $325,576. Expenses: Operating, $31,365. Revenue, $35,363: Consumers, unmetered, $26,971; metered, $7,627; other purposes, $744. MANAGEMENT.—Comrs., Chn., A. Inskeep; Secy., A. W. Elkin; Supt., E. Soles; Ch. Pump. Engr., Jno. M. Kincaid. Rept. by Supt., June 10, '96. PROJECTED IMPROVEMENTS.—Driven wells supply, including new pumps and also filtration of supply. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 13, '83.

247. **M'KEES ROCKS,** Allegheny Co. (1,687.) Supply from Monongahela Water Co. See Pittsburg.

164. **M'SHERRYTOWN,** Adams Co. (1,020.) Built in '94 by McSherrytown Water Co.; put in operation May 1. Planned and built by Co. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 300,000 galls.; Worthington. Bituminous coal used; av. cost, $2.45 per short ton. STAND-PIPE.—Cap., 105,000 galls.; 16 x 70 ft. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 3 miles. Taps, 59; made by Co. for $5. Co. cannot compel use of meters. Hydrants, 24. CONSUMPTION.—(Galls.) av., 25,000. FINANCIAL.—Cost, $15,700. Cap. Stock: Authorized, $15,000; all paid-up; paid 3% div'd in '96. Floating debt, $700, at 5%. MANAGEMENT.—Prest., Geo. L. Rice; Secy., C. F. Smith; Treas. and Supt., C. D. Smith; Ch. Pump. Engr., S. A. Eline. Rept. by Supt., Nov. 9, '96. SEWERS.—None.

165. **MACUNGIE,** Lehigh Co. (644.) Built in '95 by borough. Engr., L. J. H. Grossart, Allentown. Contrs., O'Reilly & Nolan, Reading. SUPPLY.—By gravity from reservoir. RESERVOIR.—Cap., 350,000 galls.; 216 ft. above town. DISTRIBUTION.—Taps, 75. Services, galv. i.; paid for by owner. Hydrants, 30. PRESSURE.—Ordinary, 93 lbs. FINANCIAL.—Cost, $12,000. MANAGEMENT.—Prest., H. Neumeyer; Secy., A. B. Neumeyer; Treas., H. M. Schell. Rept. by Secy., Aug. 11, '96. SEWERS.—None.

166. **MAHANOY CITY,** Schuylkill Co. (11,286.) Built in '68 by Mahanoy City Water Co. FRANCHISE.—Perpetual. Rates not subject to regulation by city. Co. is exempt from local taxes. City to pay $100 per annum for public service. LEGAL DIFFICULTIES.—Press repts. in '93 stated that there was litigation over proposed municipal works. SUPPLY.—Springs and stream, by gravity and pumping. Drainage area (in '89), 5 sq. miles. PUMPS—Cap., 2,000,000 galls.; Worthington comp. cond. Anthracite pea coal used; av. cost, $2.30 per short ton. RESERVOIRS.—Cap., 180,000,000 galls.; 100,000,000 and 80,000,000. Press rept. in '92 stated that one of the dams had been injured by flood. FISCAL YEAR CLOSED April 1, '96. DISTRIBUTION.—Mains, 20 miles. Taps, 2,300; made by consumer, fee, 25 cts. Services, lead; paid for by owner. Meters, 90; owned, controlled and repaired by Co. Use of meters optional neither with Co. nor consumers; compulsory for steam users, factories, saloons. Hydrants, 45. CONSUMPTION.—(Galls.) av., 1,675,000; min., 1,500,000. PRESSURE.—Ordinary, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $350,000. Cap. Stock: Authorized, $100,000; paid-up, $94,000. Bonded debt, $100,000, at 5%. Expenses: Operating, $12,000. MANAGEMENT.—Prest., E. S. Silliman; Secy., C. S. Parmley; Supt., E. Silliman. Rept. by Supt., June 10, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Feb. 18, '82.

P 21. **MAHONINGTOWN,** Lawrence Co. (2,079.) Mahoningtown Water Co., incorp. Dec. 8, '96. Cap. stock, $1,000. Address Jno. C. Wallace, New Castle, Pa.

167. **MALVERN,** Chester Co. (641.) First supplied by Malvern Water Co.; bought by borough Apr. 4, '96, for $3,250; new works put in operation Sept. 30, '96. Engr., Horatio Sands, Pottstown. Contrs., W. S. Wagner, Auburndale, Mass., and Potter Bros., Pottstown. SUPPLY.—Springs and artesian well, pumping with overshot wheel and pump from former, and with windmill from latter, to stand-pipe. A steam pump is also used at springs. STAND-PIPE.—Cap., 94,000 galls.; iron, 15 x 70 ft. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by bonds. Taps, made by borough. Services, lead; paid for by property owner. Use of meters optional with borough. Hydrants, 14. PRESSURE.—Ordinary, 35 lbs. FINANCIAL.—Cost, $9,000. Bonded debt, $9,000, at 4%, due in 30 yrs. Expenses, operating, about $250. Revenue, consumers, $850. Rept. by Geo. R. Walton, Dec. 21, '96. SEWERS.—Has sanitary sewers only.

168. **MANHEIM,** Lancaster Co. (2,070.) Built in '85 by Manheim Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulations by city. Co. is exempt from local taxes. City to pay $600 for fire protection and sanitary purposes. No legal difficulties. SUPPLY.—Lehman's Creek, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; Worthington comp. non-cond. Anthracite buckwheat coal used; av. cost, $3 per short ton. RESERVOIRS.—Cap., 1,000,000 galls.; 400,000 and 600,000. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 4⅝ miles; cost extensions met by income. Taps, 268; made by Co. for $2. Services, galv. i.; paid for by consumer. Meters, 5; owned and controlled by Co. Use of meters optional with Co.; compulsory for factories. Hydrants, 58. CONSUMPTION.—(Galls.) max., 70,000; min., 60,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $33,000. Cap. Stock: Authorized, $2,800; all paid-up. Sinking Fund, $2,100. Expenses:

Operating, $844; taxes, $157. Revenue, City, fire protection and sewer flushing, $600. MANAGEMENT.—Prest., A. Kline; Secy., B. H. Hershy. SEWERS.—None.

110. **MANOR STATION,** Westmoreland Co. (578.) Supply from Greensburgh.

337. **MARCY** (P. O., Tunkhannock?) Wyoming Co. (?) (Not given.) See Spring Brook Water Supply Co., Wilkes-Barre.

169. **MARIETTA,** Lancaster Co. (2,402.) Built in '93 by Marietta Gravity Water Co.; put in operation in Oct. Engrs., Stanwix Engineering Co., Rome, N. Y. Contr., Jno. B. Foley, Philadelphia. FRANCHISE.—10 yrs. from '98; provides for purchase of works by city after 10 yrs. City to pay $20 per hydrant per yr. No legal difficulties. SUPPLY.—Duggan and Wild Cat Runs, by gravity. Pumping in case of emergency from Susquehanna River. PUMPS.—Cap., 600,000 galls.; Snow. RESERVOIRS.—Cap., 1,500,000 galls.; 1,000,000 and 500,000. FISCAL YEAR CLOSED Jan. 14, '96. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by income. Taps, 209; made by plumbers for $2. Services, galv. i.; paid for by consumer. Meters, 3; owned, controlled and repaired by Co.; yearly rental, 10% of cost. Co. can compel use of meter and any consumer may have one. Hydrants, public, 42; private, 3. CONSUMPTION.—(Galls.) av., 75,000; max., 100,000; min., 50,000. PRESSURE.—Ordinary, 87 lbs. FINANCIAL.—Cost, $63,000. Cap. Stock: Authorized, $40,000; paid-up. Debt, $21,993: Floating, $11,653; Bonded, $10,340. Expenses, taxes, $209. Revenue: Consumers, $1,578; City, fire protection, $840. MANAGEMENT.—Prest. and Supt., J. H. Haldeman; Secy., A. D. Wike; Treas., H. S. Rich. Kept. by Prest., June 24, '96. SEWERS.—Has some sanitary and storm sewers.

170. **MARTINSBURG,** Blair Co. (588.) Built in '92 by Martinsburg Water Co. SUPPLY.—By gravity. DISTRIBUTION.—Meters, 0. Hydrants, 11. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cap. Stock: Authorized, $20,000; paid-up, $10,000. MANAGEMENT.—Prest., W. P. Smith; Secy., O. W. Gardner, both of Hollidaysburg; Treas., W. S. Nicodemus. SEWERS.—None.

171. **MARYSVILLE,** Perry Co. (1,115.) Built in '95 by Marysville Water Co.; put in operation Nov. 1. Engr., S. W. Cooper, Millersburg. Contr., J. W. Beers. FRANCHISE.—10 yrs. from '95. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay for public service other than water furnished to public school buildings. No legal difficulties. SUPPLY.—Two mountain streams, pumping to distributing reservoir. RESERVOIR.—Cap., 250,000 galls.; distributing. FISCAL YEAR CLOSED Nov. 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by bonds. Taps, 160. Services, galv. i.; paid for by Co. Meters, 19; owned, controlled and repaired by consumer. Use of meter optional with consumer. Hydrants, public, 20; private, 1. CONSUMPTION.—(Galls.) av., 125,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $18,000. Cap. Stock: Authorized, $30,000; all paid-up; paid no div'd in '95. Floating debt, $1,600, at 6%; Bonded debt, $16,000, at 6%, due in 1905. Expenses, State tax, $37.50. Revenue, $2,034: Consumers, unmetered, $600; metered, $1,034; City, fire protection, $400. MANAGEMENT.—Prest., H. M. Horner, Carlisle; Secy., John A. Herrman, Harrisburg; Treas., J. W. Beers. Rept. by Treas., Jan. 4, '97. SEWERS.—Has storm sewers only.

172. **MAUCH CHUNK AND EAST MAUCH CHUNK,** Carbon Co. (Mauch Chunk, 4,101; East Mauch Chunk, 2,772.) Built in '49 by Mauch Chunk Water Co. to supply Mauch Chunk; in '61 domestic supply was introduced in East Mauch Chunk. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs, by gravity, from impounding reservoirs. RESERVOIRS.—Cap., not given; four, impounding. FISCAL YEAR CLOSED March 1, '96. DISTRIBUTION.—Mains (in '90), 4 miles; cost extensions met by income. Taps, 600; made by Co., free. Services, lead; paid for by owner. Meters, 4. Hydrants, public, 50; private, 1. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $5,000. Cap Stock: Authorized, $5,000; all paid-up; paid 10% div'd in '95. Expenses, $1,991: Operating, $1,602; taxes, $389. Revenue, consumers, unmetered, $7,500. MANAGEMENT.—Prest., Jas. J. Blakeslee; Secy., S. S. Smith; Treas., C. O. Skeer. Rept. by Secy., July 13, '96. SEWERS.—None. REFERENCE.—Eng. News, Dec. 24, '81.

173. **MAYERSVILLE** (P. O., York), York Co. (Not given.) Built in '90 by Mayersville Water Co. for general supply. SUPPLY.—Codorus Creek, pumping to reservoir. MANAGEMENT.—Treas., Jacob A. Mayer.

174. **MEADVILLE,** Crawford Co. (9,520.) Built in '74-5 by Meadville Water Co. FRANCHISE.—20 yrs. from '74; provides for purchase of works by city after 20 yrs. Rates not subject to regulation by city. Co. is exempt from local taxes. LEGAL DIFFICULTIES.—City has paid Co. nothing for last three years; wishes to buy or build municipal works. Bids for municipal works have been received one or more times and matter has been in courts. SUPPLY.—French Creek, pumping to reservoir; filtered through gravel bed. PUMPS.—Cap., 5,000,000 galls.; Knowles, 3,000,000; Lang water power, 1,250,000 and 750,000. FILTERS.—Cap., not given; gravel; gravel renewed once in 4 yrs. RESERVOIR.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 22 miles. Taps, 1,700; made by Co. at cost. Services, galv. i.; paid for by consumer. Meters (in '90), 40; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for hotels. Hydrants, public, 107; private, 4.

CONSUMPTION.—(Galls.) av., 1,200,000; max., 2,000,000; min., 1,000,000. PRESSURE.—Ordinary, 110 lbs. Steam fire engines are seldom used. FINANCIAL.—Cost, $185,000. Cap. Stock: Authorized, $180,000; all paid-up; paid 6% div'd in '95. Expenses, $12,100: Operating, $11,500; taxes, $600. Revenue, consumers, $23,500. MANAGEMENT.—Prest., J. D. Gill; Secy. and Treas., E. Hindekoper; Supt., Geo. S. Cullum. Rept. by Supt., July 21, '96. PROJECTED IMPROVEMENTS.—Plans for improvements comp. Dec., '96, by Isaac Cassin & Son, Philadelphia. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Nov. 5, '81.

175. **MECHANICSBURG,** Cumberland Co. (3,691.) Built in '57-8 by Mechanicsburg Gas & Water Co. FRANCHISE.—Co. is exempt from local taxes. City to pay $800 per yr. for public service. No legal difficulties. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 1,850,000 galls.: Receiving, 650,000; distributing, 1,200,000. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 10 miles. Taps, 600; made by plumbers for $2.50. Services, iron; paid for by consumer. Hydrants, 48. PRESSURE.—Ordinary, 30 lbs. Steam fire engines are used. FINANCIAL.—Expenses, $1,117: Operating, $976; taxes, $141. Revenue, $1,400: Consumers, unmetered, $600; City, fire protection, $800. MANAGEMENT.—Prest., H. S. King; Secy. and Treas., A. G. Richwine. Rept. by Secy., July 22, '96. SEWERS.—None. REFERENCE.—Eng. News, Mar. 1, '84.

176. **MEDIA,** Delaware Co. (2,736.) Built in '71 by borough. SUPPLY.—Ridley Creek, pumping to reservoir. PUMPS.—Cap., 1,400,000 galls.: 1,000,000 Worthington water power; 400,000 Knowles steam. RESERVOIRS.—Cap., 1,250,000 galls. DISTRIBUTION.—Mains, 6.6 miles. Taps, 400. Hydrants, 75. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $80,000. Bonded debt, $65,000, at 4%. Expenses: Operating, $1,000; int., $2,600. Revenue, $5,500. NOTE.—No rept. since '88 Manual. REFERENCE.—Eng. News, Dec. 30, '82.

226. **MELROSE** (P. O., Ashbourne), Philadelphia Co. (Included in Philadelphia.) See Oak Lane.

177. **MERCER,** Mercer Co. (2,138.) Built in '87 by Mercer Water Co. CONTRACT.—(Press rept.) 10 yrs. from Jan. 1, '87; $805 per yr. for hydrants. Jan. 13, '97, contract had not been renewed. SUPPLY.—Otter Creek, pumping to tank and direct in case of fire; filtered. PUMPS.—Cap., not given; Smith & Vaile, 1,500,000 and 600,000. Also new pump, added in '90. TANK.—Cap., 67,000 galls.; iron; 24 × 20 ft., on iron trestle, 60 ft. high. DISTRIBUTION.—Mains, 4.5 miles; cost extensions met by revenue. Taps, 240. Meters, 2. Hydrants, 23. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $40,000. Cap. Stock, authorized, $24,000. Bonded debt, $12,000, at 6%, due '96. Expenses, $1,720: Operating, $1,000; int., $720. Revenue, $3,130: Consumers, $2,300; City, fire protection, $805; other purposes, $25. NOTE.—No rept. since '90-1 Manual.

37. **MERION** (P. O., Gladwyne), Montgomery Co. See Bryn Mawr.

37. **MERIONVILLE** (No P. O.), Montgomery Co. See Bryn Mawr.

178. **MESHOPPEN,** Wyoming Co. (597.) Built in '73 by Meshoppen Borough Water Co. SUPPLY.—Brook and springs, by gravity; filtered through gravel and charcoal between stone walls at dam. RESERVOIR.—Cap., 50,000 galls.; distributing. DISTRIBUTION.—Mains, 3.4 miles. Services, galv. 1.; paid for by Co. to curb. Meters, 0. Hydrants, 17. PRESSURE.—Ordinary, 50 lbs.; fire, 65 lbs. FINANCIAL.—Cap. Stock: Authorized, $18,000; all paid-up. No bonds. Revenue: City, fire protection, $460. MANAGEMENT.—Prest., A. A. Sterling, Wilkes-Barre; Secy., Treas. and Supt., Arthur H. Sterling. Rept. by Supt., Dec. 21, '96. SEWERS.—Has partial storm sewers only.

179. **MEYERSDALE,** Somerset Co. (1,847.) Built in '88 by Sand Spring Water Co. FRANCHISE.—20 yrs. Rates not subject to regulation by city. City to pay $600 per yr. No legal difficulties. SUPPLY.—Sand spring and Storm Run, by gravity. RESERVOIRS.—Cap., 880,000 galls.: Sand spring, 700,000; Storm Run, 180,000. FISCAL YEAR CLOSED Dec. 18. DISTRIBUTION.—Mains, 6 miles. Taps, 325; made by Co., free. Services, iron; paid for by Co. to curb. Meters, 1; owned by consumer, controlled and repaired by Co. Co. can compel use of meter and any consumer may have one. Hydrants, public, 24; private, 1. PRESSURE.—Ordinary and fire, 125 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $25,000; all paid-up; paid 6% div'd in '95. Bonded debt, $2,700, at 5%. Expenses, $827: Operating, $565; int., $137; taxes, $125. Revenue, $3,200: Consumers, unmetered, $2,600; City, fire protection, $600. No deficits. MANAGEMENT.—Prest., A. F. John; Secy., S. B. Philson; Treas. and Supt., E. J. Weld. Rept. by Supt., Sept. 11, '96.

180. **MIDDLETOWN,** Dauphin Co. (5,080.) Built in '85 by Middletown Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Swatara Creek, pumping to stand-pipe. PUMPS.—Cap., 230,000 galls.; Raymond & Campbell water-power. STAND-PIPE. — Cap., 210,000 galls.; 16 × 140 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 257. Meters, 2. Hydrants, 37. CONSUMPTION.—(Galls.) av., 125,000. FINANCIAL.—Cost, $57,000. Cap. Stock, $50,000. Bonded debt, $25,000. Revenue: Consumers, $3,600; City, $1,600. NOTE.—No rept. since '90-1 Manual and since '88 as to distribution and financial.

181. **MIFFLINTOWN,** Juniata Co. (877.) Built in '92 by Mifflintown Water Co.; put in operation Oct. 8, '92. Engr., N. C. Freck, Millersburg. Contrs., Mellen Machine Co.,

Reading. FRANCHISE.—Perpetual. City to pay $360 per annum for public service. No legal difficulties. SUPPLY.—Macedonia River, by gravity. Oct. 26, '96, B. G. Coon, Kingston, rept. he had just been awarded contract for 450,000-gall. reservoir; Engr., S. W. Cooper. FISCAL YEAR CLOSED Oct. 31, '95. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income. Taps, 200; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 12. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cap. Stock: Authorized, $40,000. Bonded debt, $15,000, at 5%, due 1912. Revenue: City, fire protection, $360; public buildings, $100. MANAGEMENT.—Prest., Lucien Bank; Secy., Robt. E. Parker; Treas., T. V. Irwin; Supt., H. D. Funk. Rept. by T. V. Irwin, Sept. 5, '96. SEWERS.—Has private sewers.

182. **MILFORD,** Pike Co. (793.) Built in '66 by Milford Water Co., under perpetual charter. CHARTER.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Spring, by gravity. FISCAL YEAR CLOSED May, '96. DISTRIBUTION.—Mains, 4 miles. Taps, 140. Services, iron and lead. Meters, 0. Hydrants, 30. FINANCIAL.—Cap. Stock, $15,800. Expenses: Operating, $150. MANAGEMENT.—Prest., J. C. Wallace; Secy., C. P. Mott; Treas., P. N. Bouringue; Supt., M. Armstrong. Rept. by Secy.

183. **MILLERSBURG,** Dauphin Co. (1,527.) Built in '91 by Millersburg Home Water Co SUPPLY.—Springs, by pumping. PUMPS.—Cap., 250,000 galls.; Worthington high pressure. FINANCIAL.—Cost, $30,000. Cap. Stock, paid-up, $20,000. Bonded debt, $10,000. NOTE.—No rept. since '90-1 Manual.

184. **MILLERSTOWN** (P. O., Chicora), Butler Co. (1,162.) Built in '74 by borough and H. A. Leopold. SUPPLY.—Artesian well, pumping to tanks. PUMPS.—Cap., 80,000 galls.; gas engine and power pump; gas costs $3.50 a month. DISTRIBUTION.—Mains, 4 miles. Taps, 120. Services, iron; paid for by consumer. Meters, 0. Owner can compel use of meters and any consumer may have one. PRESSURE.—Ordinary, 25 to 75 lbs.; fire, 90 lbs. FINANCIAL.—Floating debt, $1,000, at 4%. Expenses, operating, $1,200. MANAGEMENT.—Owner, H. A. Leopold, Chicora. Rept. by Supt., June 8, '96.

299. **MILLMONT** (No P. O.), Delaware Co. See Swarthmore.

185, 186. **MILLVALE** (P. O., Bennett), Allegheny Co. (3,809.)

BENNETT WATER CO.'S WORKS.

Built in '90-1. LEGAL DIFFICULTIES.—Co. tried and failed to prevent borough from building municipal works. SUPPLY.—Allegheny River, through submerged filter-crib, pumping to elevated tank. PUMPS.—Cap., not given; Hall. FILTERS.—Cap., 1,000,000 galls. TANK.—Cap., 280,000 galls.; 40 × 80 ft. DISTRIBUTION.—Mains, 5 miles. Hydrants, 30. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $150,000. Bonded debt, $50,000, at 6%. Revenue, City, fire protection, $1,200. NOTE.—No rept. since '90-1 Manual.

BOROUGH WORKS.

Built in '93-4 by borough; put in operation Mar. 1. Engr., Jacob Schinneller, Pittsburg. Contr., Chandley Bros., Beaver Falls. SUPPLY.—Allegheny River, through submerged filter-crib, pumping to elevated tank. PUMPS.—Cap., 4,000,000 galls.; one comp. dup.: one horizontal. FILTER CRIB.—100 × 28 ft.; plank covered, placed 4 ft. below river bottom; covered with stone and gravel. TANK.—Cap., 420,000 galls.; 50 × 30 ft.; 285 ft. above river. FISCAL YEAR CLOSED March 4, '96. DISTRIBUTION.—Mains, 7.6 miles; cost extensions met by public funds. Taps, 320; made by borough. Services, lead; paid for by borough. Meters, 0. Use of meters optional with consumer. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 650,000; max., 750,000; min., 550,000. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Cost, $66,000. Expenses, $8,800: Operating, $5,100; int., $3,700. Revenue, $13,600: Consumers, $6,000; City, fire protection, $2,800. MANAGEMENT.—Prest., R. R. Dewar; Secy., C. W. Dankmyer; Treas., J. Davis; Supt., Jno. Wallace; Ch. Pump. Engr., A. J. Schmitt. Rept. by Saml. Eades, Burgess, Oct. 7, '96. SEWERS.—Has sanitary and storm sewers in a few streets only. NOTE.—Expenses and revenue, except hydrant rental, is for water and electric light plants combined. REFERENCE.—Filter cribs, Eng. News, May 10, '94.

187. **MILTON,** Northumberland Co. (5,317.) Built in '83 by Milton Water Co. FRANCHISE.—50 yrs. from '83; provides for purchase of works by city every 10 yrs. Rates not subject to regulation by city. Co. not exempt from local taxes. City to pay $20 per hydrant per yr. No legal difficulties. SUPPLY.—West branch of Susquehanna River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington, one comp. non-cond., one high pressure. Coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 500; made by plumbers for $1. Services, galv. i.; paid for by consumer. Use of meters optional with consumer. Hydrants, 88. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. Steam fire engines are used. FINANCIAL.—Cost, $70,000. Cap. Stock: Authorized, $50,000; all paid-up; paid 6% div'd in '95. Bonded debt, $5,000, at 4%. Expenses, $4,600: Operating, $4,000; int., $200; taxes, $400. Revenue, $7,160: Consumers, unmetered, $5,500; City, fire protection, $1,660. MANAGEMENT.—Prest. and Supt., P. J. Criste; Secy., H. R. Frick. Rept. by Secy., June 28, '96. SEWERS.—None. REFERENCE.—Eng. News, Nov. 3, '83.

337. MINERS HILL (No P. O.), Luzerne Co. (2,075.) Supply from Spring Brook Water Supply Co., see Wilkes-Barre.

188. MINERSVILLE, Schuylkill Co. (3,504.) Built in '57-61 by Minersville Water Co. FRANCHISE.—Perpetual. Rates not subject to regulations by city. Co. not exempt from local taxes. No legal difficulties. SUPPLY.—Mountain springs, by gravity. RESERVOIR.—Cap., 7,500,000 galls.; three distributing: Wheeler Creek, 1,000,000; Wagner Run, 1,500,000; Dyers' Run, 5,000,000; on Broad Mountain north of town. Alex. Potter, N. Y. City, repts. he designed a large storage reservoir in '96, which will probably be built in '97. FISCAL YEAR CLOSED Jan. 1, '95. DISTRIBUTION.—Mains, 9½ miles; cost extensions met by income. Taps made by Co. for $3. Services, lead; paid for by consumer. Meters, 6; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for collieries. Hydrants, 31. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 100 lbs. Steam fire engines are used only in emergency. FINANCIAL.—Cost, $90,000. Cap. Stock: Authorized, $107,125; all paid-up. Floating debt, $1,500, at 5%. Expenses: Operating, $2,000; taxes, $450. MANAGEMENT.—Prest., Col. G. L. Brown; Secy. and Supt., Chas. R. Kear; Treas., Chas. E. Steele. Rept. by Supt., June 6, '96. PROJECTED IMPROVEMENTS.—Reservoir, cap., 200,000,000 galls. SEWERS.—None.

189, 337. MINOOKA, Lackawanna Co. (Not given.) Built in '88 under four charters, viz.: Minooka, Taylorville, Bellevue and Peoples' (of Scranton) Water Cos. Now controlled by Spring Brook Water Supply Co.; see Wilkes-Barre. SUPPLY.—Cold Spring reservoir, by gravity. RESERVOIR.—Area, about 23 acres. DISTRIBUTION.—Mains, 20 miles. Taps, 500. Meters, 2. Hydrants, not given. PRESSURE.—Ordinary (in '89), 85 to 200 lbs. FINANCIAL.—Cost, $30,000. No debt. Revenue, consumers, $3,687. NOTE.—No separate rept. as to distribution and financial since '89; see Spring Brook Water Supply Co., Wilkes-Barre.

190. MONACA, Beaver Co. (Not given.) Built in '95 by borough; put in operation Dec. 1. Engr., J. P. Leaf, Rochester. Contr., Chandley Bros., Beaver Falls. SUPPLY.—Wells, pumping to reservoir. There are six 8-in. wells in gravel on beach of the Ohio River. PUMPS.—Cap., 800,000 galls.; Hall. Pittsburg bituminous coal used; av. cost, $1.82 per short ton, delivered. RESERVOIR.—Cap., 1,000,000 galls.; 296 feet above the river. DISTRIBUTION.—Mains, 5 miles; cost extensions met by general taxation. Taps, 165; made by borough for $1.50. Services, lead; paid for by consumer. Water is free, paid by general taxation. Hydrants, 50. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 135 lbs. FINANCIAL.—Cost, $24,000. MANAGEMENT.—Prest., W. A. Miksch; Secy., S. Hamilton; Treas., H. C. Glasser; Supt., J. W. Ramsey. Rept. by Supt., Aug. 22, '96. SEWERS.—Has sanitary sewers only.

191. MONONGAHELA CITY, Washington Co. (4,096.) Built in '88-9 by Monongahela City Water Co.; controlled by Kittanning Consolidated Water Co. In '90 or '91 South View Water Co. was consolidated with above. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Monongahela River, pumping from filter well to reservoir. Well is about 125 from low water mark, 20 ft. in diam., carried 10 ft. below river bottom. PUMPS.—Holly dup., 1,000,000 galls. RESERVOIR.—Cap., 1,600,000 galls.; 282 ft. above river. DISTRIBUTION.—Mains, 9.5 miles. Taps, 149. Hydrants, 20. FINANCIAL.—Cost, $63,000. Cap. Stock: Authorized, $130,000. Bonded debt (in '89), $30,000, at 6%. Revenue: City, fire protection, $500. MANAGEMENT.—Mayor, S. Clarke Wilson; Chn. Com. on Fire and Water, S. Miller Downer; City Clk., W. H. Jones. SEWERS.—Has sewers. NOTE.—No rept. since '90-1 Manual.

192. MONTOURSVILLE, Lycoming Co. (1,278.) Built in '92-3 by borough; put in operation about April 1. Contr., Jas. P. Herdic, Williamsport. SUPPLY.—Original, not given. In '95 it was proposed to dig a 14 × 25 ft. well and put in Knowles pump. RESERVOIR.—100 × 75 ft., 12 ft. deep. Above from press repts.

193. MONTROSE, Susquehanna Co. (1,735.) Built in '93 by Consumers' Water Co.; put in operation Feb. 8. SUPPLY.—Jones Lake, by pumping. PUMPS.—Cap., 300,000 galls.; Janesville. Anthracite, culm and buckwheat coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 1,500,000 galls.; storage. DISTRIBUTION.—Mains, 6 miles. Taps, 225; made by Co for $5. Services, lead and iron; paid for by consumer. Meters, 0. Hydrants, 20. CONSUMPTION.—(Galls.) av., 140,000; max., 176,000; min., 100,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. D. Stoeker; Secy., C. S. Welles; Treas., J. J. Williams; Supt., E. C. Sherman. Rept. by Supt., July 20, '96. SEWERS.—None.

299. MOORES, Delaware Co. (390.) See Swarthmore.

194, 337. MOOSIC, Lackawanna Co. (693.) Built in '86-7 by Spring Brook Water Co.; now controlled by Spring Brook Water Supply Co., see Wilkes-Barre. SUPPLY.—Spring Brook, pumping to reservoir. PUMPS.—Cap., 2,500,000 galls.; from W. F. Mattes, Scranton; 1,500,000 (makers rept. Worthington). RESERVOIR.—Cap., 1,250,000 galls. DISTRIBUTION.—(In '88.) Mains, 12 miles. Taps, 375. Services, galv. i. Meters, 2. Hydrants, 8. CONSUMPTION.—(Galls.) av., 500,000. FINANCIAL.—(In '88.) Cost, $54,000. Cap. Stock: Authorized, $50,000; paid-up, $30,000. Bonded debt, $15,000, at 6%. Expenses: Operating, $1,700; int., $900. Revenue: Consumers, $6,620; City, fire protection, $280.

NOTE.—No separate rept. since '90-1 Manual; see Spring Brook Water Supply Co., Wilkes-Barre.

140. **MORRELLVILLE** (P. O. Johnstown), Cambria Co. (2,827.) See Johnstown.

195. **MORRISVILLE**, Bucks Co. (1,203.) Built in '94 by borough. Engr., E. G. Weir, Trenton, N. J. SUPPLY.—Delaware River, pumping to stand-pipe. PUMPS.—Cap., 1,440,000 galls.; Blake dup. high pressure. Bituminous coal used; av. cost, $1.75 per short ton. STAND-PIPE.—Cap., 88,000 galls.; 10 x 150 ft. FISCAL YEAR CLOSED March 2, '96. DISTRIBUTION.—Mains, 4 miles; cost extensions met by appropriations. Taps, 79; made by borough for $5. Services, galv. t.; paid for by owner. Meters, 4; owned and repaired by consumer; controlled by borough. Use of meters optional with borough; compulsory for factories and shops. Hydrants, 32. CONSUMPTION.—(Galls.) av., 72,000; max., 100,500; min., 61,500. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $26,221. Bonded debt, $24,000, at 5%, due 1923. Expenses: Operating, $1,260. Revenue, $1,204: Consumers, unmetered, $777; metered, $427. MANAGEMENT.—Secy., Wm. E. Margolf; Treas., Wm. L. Adair. Rept. by Secy., July 25, '96. SEWERS.—None.

196. **MOSCOW**, Lackawanna Co. (582.) Built in '93, probably by Co. Moscow Water Co. projected works in '91 and may have built plant.

253. **MOUNT CARBON** (P. O. Pottsville), Schuylkill Co. Supply from Pottsville.

197. **MOUNT CARMEL**, Northumberland Co. (8,254.) Built in '85 by Mount Carmel Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs, by gravity. RESERVOIRS. Cap., 5,000,000 galls.; two. DISTRIBUTION.—Mains, 5½ miles. Taps, 350. Meters, 42. Hydrants, 36. FINANCIAL.—Cost (in '88), $85,000. Cap. Stock, $25,000. Expenses, operating, $500. NOTE.—No rept. since '90-1 Manual.

198. **MOUNT HOLLY SPRINGS**, Cumberland Co. (1,190.) Built in '95 by Mount Holly Water Co.; put in operation Aug. 15. Engr. and Contr., E. S. Whitney, Allentown. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $20 per hydrant per yr. No legal difficulties. SUPPLY.—Spruce Run and Cold Spring, by gravity. RESERVOIR.—Cap., 500,000 galls.; three miles from borough on South Mountain. FISCAL YEAR CLOSED Aug 1, '96. DISTRIBUTION.—Mains, 5 miles. Taps, 65; made by plumbers. Services, galv. t.; paid for by consumer. Meters, 0. Hydrants, public, 24; private, 2. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 52 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $25,000; all paid-up. Bonded debt, $25,000, at 5%. Expenses, $1,550: Operating, $200; int., $1,250; taxes, $100. Revenue, $1,700: Consumers, unmetered, $1,300; City, fire protection, $400. MANAGEMENT.—Prest., E. S. Whitney, Allentown; Treas., R. E. Wright; Supt., C. Harman. Rept. by Treas., Oct. 2, '96. SEWERS.—Has storm sewers only.

199. **MOUNT JEWETT**, McKean Co. (Not given.) Built since '91 (probably '94) by Mt. Jewett Water Co. Engr., Geo. Thompson, Mt. Jewett. Contr., D. E. Kendig, Johannesburg. SUPPLY.—Springs, pumped to tanks. DISTRIBUTION.—Hydrants, 10. FINANCIAL.—Cost, $15,000. MANAGEMENT.—Prest., M. J. Gallup; Secy., E. C. Cleveland; Treas., H. J. Brennan. Rept. by A. C. Phillips, Burgess, Aug. 5, '96.

200. **MOUNT JOY**, Lancaster Co. (1,848.) Built in '74 by borough. SUPPLY.—Chique Salunga Creek, pumping to reservoir, with direct pumping for fire protection. PUMP.—Cap., 1,000,000 galls.; Worthington comp. non-cond. Anthracite pea coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 750,000 galls. FISCAL YEAR CLOSED Dec. '31, '95. DISTRIBUTION.—Mains, 3 miles. Taps, 365; made by borough for $3. Services, galv. t.; paid for by owner. Meters, 0. Hydrants, 28. PRESSURE.—Ordinary, 88 lbs.; fire, 45 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $38,000, at 4%. Expenses, $2,597: Operating, $925; int., $1,520; taxes, $152. Revenue, $3,117: Consumers, $2,706. MANAGEMENT.—Prest., H. L. Stager; Secy., D. M. Martin; Treas., Union National Bank; Supt., Wm. Kuhn. Rept. by Supt., June 15, '95. PROJECTED IMPROVEMENTS.—Increase in pumping plant. SEWERS.—None. REFERENCE.—Eng. News, Oct. 15, '81.

247. **MOUNT OLIVER**, Allegheny Co. (1,927.) Supply from Monongahela Water Co. See Pittsburg.

201. **MOUNT PLEASANT**, Westmoreland Co. (3,652.) Built in '86 by Mount Pleasant Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Jacob's Creek, pumping to reservoir and stand-pipe. PUMPS.—Cap., 3,500,000 galls.; Gordon, 2,500,000 and 1,000,000. DISTRIBUTION.—Mains, 8½ miles. Taps, est., 288. Meters, 0. Hydrants, 74. CONSUMPTION.—(Galls.) av., 1,036,000. FINANCIAL.—Cost, $150,000. Cap. Stock: Authorized, $150,000, all paid-up. No debt. Expenses, $6,209. Revenue, $15,651: Consumers, $2,123; City, fire protection, $1,625; other purposes, coke ovens, $11,903. NOTE.—No rept. since '90-1 Manual.

F 22. **MOUNT POCONO**, Monroe Co. (336.) Projected by Mt. Pocono Water Co., which was incorp. Mar. 8, '95, with $4,000 authorized cap. stock. Treas., Edw. E. Hooker (in '95).

D 15. **MUMMASBURG**, Adams Co. (128.) Built in '96 by J. J. Plank, Gettysburg, for domestic supply; put in operation July 15. A 3,250-gall. pump driven by wind-

mill lifts water to a 6,500-gall. tank. Taps, 17. Services, paid for by consumer. Meters, 0. Cost, $400. Rept. by owner, Sept., 5, '96.

202. **MUNCY,** Lycoming Co. (1,295.) Built in '89 by Muncy Water Co.; put in operation Jan. 1, '90. SUPPLY.—Springs, gathered in mountain stream, by gravity from reservoir. RESERVOIR.—Cap., 1,500,000 galls.; 250 ft. above town. DISTRIBUTION.—Mains, 7½ miles; 10 to 4-in. Taps, 24. Meters, 0. Hydrants, 20. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock: Authorized, $36,000; all paid-up. Debt, none; bonds authorized, $35,000. Expenses: Operating, $250. Revenue: Consumers, $1,710; City, fire protection, $600. NOTE.—No rept. since '90-1 Manual.

203. **MYERSTOWN,** Lebanon Co. (1,880.) Built in '95 by Myerstown Water Co.; put in operation Jan. 1, 96. Engr. and Contr., Edgar B. Kay, Bellwood. SUPPLY.—Springs, by gravity, pumping as auxiliary. PUMP.—Cap., 250,000 galls.; rotary driven by 18-in. Lancaster turbine wheel. RESERVOIR.—Cap., 43,250,000 galls.; 250,000 storage, ½ mile from town; 3,000,000, distributing,at springs and 40,000,000 storage reservoir for power, formed by dam. DISTRIBUTION.—Mains,6½ miles; cost extensions met by sale of additional stock and by bonds. Taps, 200; made by Co. free. Services, lead and galv. 1.; paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, 20. CONSUMPTION.—(Galls.) av., 60,000; max., 70,000; min., 40,000. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cost, $40,000. Cap. Stock: Authorized, $25,000; all paid-up. Bonded debt, $20,000, at 5%; due in 20 yrs., with option after 5 yrs. Expenses, $1,180: Operating, $100; int., $1,000; taxes, $80. Revenue: Consumers, est., $1,500. Deficits are met by assessments on stock. MANAGEMENT.—Prest., Wm. L. Black; Secy., Geo. H. Horst; Treas., A. S. Harkness; Supt., Richard See; Engr., Edgar B. Kay. Rept. by Co., Dec. 4, '96. SEWERS.—Has storm sewers only.

204. **NANTICOKE,** Luzerne Co. (10,044.) Built in '85 by Nanticoke Water Co. Works extended 5 miles to Glen Lyon in '93. SUPPLY.—Honeoye Creek, by gravity to pumping station, thence pumping to reservoir. (5 × 54-ft. stand-pipe formerly rept. here.) PUMPS.—Cap., 4,000,000 galls.; 2—1,000,000 Gordon & Maxwell; 2,000,000 Janesville. Anthracite buckwheat coal used; av. cost, $1 per short ton. RESERVOIRS.—Cap., 47,000,000 galls.: Impounding, 25,000,000; intake, 2,000,000; distributing, 20,000,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 33 miles. Taps, made by Co. for $4 or $6. Services, galv. 1.; paid for by consumer. Meters: 12; owned, controlled and repaired by Co. Use of meters not optional with consumer; compulsory for restaurants, hotels and collieries. Hydrants, public, 48; private, 4. CONSUMPTION.—(Galls.) av., 2,100,000; max., 3,000,000; min., 1,700,000. PRESSURE.—Ordinary, 100 to 140 lbs. MANAGEMENT.—Prest., I. J. Wistar; Secy., Geo. H. Rose; Treas., A. Haviland; Supt., Geo. T. Morgan. Rept. by Mgr., Irving A. Stearns, Wilkes-Barre, Pa., Oct. 10, '96. SEWERS.—Has sanitary and storm sewers.

205. **NAOMI PINES,** Monroe Co. (Not given.) Built in '95 by Pocono Spring Water Ice Co. Engr., J. M. Young, Easton. FRANCHISE.—99 yrs. from '95. SUPPLY.—Springs. FINANCIAL.—Cap. Stock: Common, authorized, $100,000. MANAGEMENT.—Prest., R. W. Miller; Secy. and Treas., F. C. Miller. Rept. by Secy., Sept. 14, '96.

87. **NARBETH,** Montgomery Co. See Bryn Mawr.

206. **NATRONA,** Allegheny Co. (2,137.) Built in '89 by Harrison Township Water Co.; put in operation in Oct. No Contr. No charge to city for hydrant service. SUPPLY.—Springs, by gravity. CISTERNS.—Cap., 80,000 galls.; 2—40,000. DISTRIBUTION.—Mains, 4 miles. Taps, 187. Services, w. i. galv. Meters, 2. Hydrants, public, 8. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $18,361. Cap. Stock: Common, authorized, $10,000; all paid-up. Debt, $4,000, at 6%. Bonds: Authorized, $4,000; all issued. Revenue: Consumers, $2,841; City, none. MANAGEMENT.—Prest., J. E. McKelvy; Treas. and Supt., H. M. Brackenridge. Rept. by Supt., Jan. 27, '97. SEWERS.—No sewers.

207. **NAZARETH,** Northampton Co. (1,318.) Built in '69 by Nazareth Water Co. Muncipal ownership under discussion. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs and driven well by gravity and pumping to reservoir. PUMPS.—Cap., about, 125,000 galls.; one Deane steam and one Manuel wind engine. RESERVOIRS.—Cap., 194,000 galls.; 24 × 120 ft. × 9 ft. deep. FISCAL YEAR CLOSED Oct. 31. DISTRIBUTION.—Mains, 2 miles. Taps, 110. Meters, 0. Hydrants, 19. CONSUMPTION.—(Galls.) av., 18,000. FINANCIAL. Cost, $15,500. Cap. Stock: Authorized, $10,000; paid-up, $7,350; paid 5% div'd in '90. Bonded debt, $8,800, at 4½%. Expenses, $504: Operating, $300; int., $171; taxes, $33. Revenue, $935: Consumers, $650; City, fire protection, $285. MANAGEMENT.—Prest., Wm. H. Schorts; Secy. and Treas., F. Kunkel; Supt., Wm. H. Kinginger. Ch. Pump. Engr., H. M. Smickly. Rept. by Secy., July 16, '96. NOTE.—No rept. since '90-1 Manual of distribution and financial. Reported in '96 that no change had taken place in the plant since '89.

D 16. **NESCOPECK,** Luzerne Co. (698.) Built in '95 by Nescopeck Water Supply Co.; put in operation in July. Engr., Geo. W. Rafter, Rochester, N. Y. Contr., Geo. Sarver, Milton. Supply, from Berwick Water Co. Fiscal year closed July 24, '96. Mains, 4 miles; cost extensions met from revenue only. Taps, 20; made for $1.75. Services, iron or lead;

paid for by consumer. Hydrants, 0. Pressure, ordinary, 86 lbs. Cost, $18,500. Cap. Stock: Authorized, $10,000; all paid-up. Bonded debt, $10,000, at 6%; due 1945. Expenses, $810: Operating, $110; int., $600; state tax, $100. Revenue: Consumers, $1,280. Prest., Fredk. H. Eaton; Secy., C. D. Eaton; Treas., F. A. Witman, all of Berwick; Supt., G. Fred. Miller. Rept. by Prest., Aug. 31, '96.

208. **NEW ALBANY,** Bradford Co. (287.) Built in '96 by New Albany Water Co.; put in operation June 15. No Engr. nor Contr. Supplied by Towanda Water Co. before '96. SUPPLY.—Springs, by gravity. FILTERS.—Cap., 28,000 galls.; gravel and stone. RESERVOIR.—Cap., 150,000 galls. DISTRIBUTION.—Mains, 2¼ miles. Taps, 80; made by Co. free, including service to curb. Services, galv. i.; paid for by consumer from curb. Hydrants, 6. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $5,800. Cap. Stock, $6,000; all paid-up. Revenue, City, fire protection, $100. MANAGEMENT.—Prest., A. Wickiger; Secy., M. M. Corson; Treas., S. D. Steiger. Rept. by Treas., June 25, '96. SEWERS.—None.

209. **NEW BETHLEHEM,** Clarion Co. (1,026.) Built in '83 by Citizens' Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. Co. not exempt from local taxes. City to pay $325 per yr. No legal difficulties. SUPPLY.—Red Bank Creek, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Worthington. Natural gas used; av. cost, $1.00 per day. RESERVOIR.—Cap., 120,000 galls.; 32 × 64 ft., × 8 ft. deep, 165 ft. above town. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by income. Taps, 80; made by Co. for $2. Services, lead and galv. i.; paid for by owner. Meters, 0. Use of meters optional with consumer. Hydrants, 13. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $14,153. Cap. Stock: Authorized, $10,000; all paid-up; paid 6% div'd in '96. Expenses, $1,095: Operating, $1,042; taxes, $53. Revenue, $1,901: Consumers, unmetered, $1,526; City, fire protection, $325; public buildings, $50. MANAGEMENT.—Prest., S. T. Sheaffer; Secy., E. V. Marsh; Treas., J. R. Foster; Supt., Geo. L. Thomas; Ch. Pump. Engr., E. Thomas. Rept. by Secy., Aug. 11, '96. SEWERS.—Has partial sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 26, '84.

210. **NEW BLOOMFIELD,** Perry Co. (1,132.) Built by Bloomfield Water & Sewer Co.; put in operation Jan. 1, '94. SUPPLY.—Spring, by gravity. RESERVOIR.—Cap., 50,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 1¼ miles. Taps, 35. Services, iron; paid for by property owner. Meters, 0. Hydrants, 13. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cap. Stock: Authorized, $10,000; all paid-up. Bonded debt, $5,000, at 6%. Expenses: Int., $300. Revenue: Consumers, $300; City, fire protection, $325. MANAGEMENT.—Prest., A. R. Johnston; Secy. and Treas., J. W. Shull.

211. **NEW BRIGHTON,** Beaver Co. (5,616.) Built in '78-9 by New Brighton Water-Works Co. SUPPLY.—Beaver River, pumping to reservoir and direct. Press repts. in '92 speak of new pump and reservoir. PUMPS.—Cap., 1,000,000 galls.; 750,000 Worthington water-power; 250,000 Wilson & Snyder steam. FILTER.—Cap., 500,000 galls.; Hyatt (or New York). RESERVOIRS.—Cap., 500,000 galls.; 312 ft. above the river. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 13 miles. Taps, 469. Services, lead. Meters, 4. Hydrants, 55. FINANCIAL.—Cost, $65,000. Bonded debt, $25,000, at 6%. Expenses: Operating, $4,000; int., $1,500. Revenue, $8,800: Consumers, unmetered, $6,300; City, $2,500. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 11, '82.

212. **NEW CASTLE,** Lawrence Co. (11,600.) Built in '81 by New Castle Water Co. FRANCHISE.—10 yrs. from '91. Rates are fixed by contract with city. Co. is exempt from local taxes, except business tax $100 per yr. City to pay $5,000 per yr. for fire hydrants and flush tanks. SUPPLY.—Shenango River, pumping to reservoir. PUMPS.—Cap., 11,500,000 galls.: 1,500,000 Blake; 2—3,000,000 Worthington comp. cond.; 4,000,000 Norberg hor. triple exp. fly wheel. Natural gas used. RESERVOIR.—Cap., 7,500,000 galls.; distributing, 24 ft. deep; two miles from and 266 ft. above city. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 25 miles. Taps, 1,600; made by Co. free. Services, lead and iron; paid for by consumer. Meters: 70; owned by consumer; controlled and repaired by Co. City can compel use of meter and any consumer may have one. Hydrants, public, 150; private, 5. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 115 lbs. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $200,000; all paid-up; paid 2% div'd in '90. Bonded debt, $100,000, at 6%; due 1901. Expenses, $6,220: Operating, $5,868; int., $6,000; taxes, $358. Revenue, $23,350: Consumers, $17,590; City, fire protection, $5,680; other purposes, $180. MANAGEMENT.—Prest., Geo. I. Whitney; Secy., J. B. Finley; Supt., J. W. Taylor. SEWERS.—Has sewers. REFERENCE.—Eng. News, June 10, '82.

213. **NEW CUMBERLAND,** Cumberland Co. (754.) Built in '96 by Mountain Water Co.; put in operation July 1. Contr., J. W. Beers. Works were not completed and had not been accepted by Co. at time report was made; stated that they would be soon. FRANCHISE.—10 yrs. from '96. Provides for purchase of works by city, "according to state laws." City to pay $400 a year for public service. No legal difficulties. SUPPLY.—By gravity from impounding reservoir on stream. RESERVOIR.—Cap., 250,000 galls. DISTRIBUTION.—Taps, 53; made by Co., free. Hydrants, 20. PRESSURE.

—Fire, 75 lbs. FINANCIAL.—Cost, $14,000. Cap. Stock: Authorized, $10,000. Bonded debt, $15,000, at 6%. MANAGEMENT.—Prest., Henry M. Horner; Secy. and Treas., J. H. Reiff. Rept. by Co., Dec. 21, '96.

56. **NEW HAVEN,** Fayette Co. (1,221.) Supply from Connellsville.

D 17. **NEW HOLLAND,** Lancaster Co. (1,060.) Built in '95 by New Holland Water Co.; put in operation Aug. 1. Engrs., E. B. Kay and W. H. Allen. Contr., E. B. Kay, Bellwood. Supply, mountain springs, by gravity. Reservoirs, cap., 800,000 galls.; storage. Mains, 5 miles. Taps, 92; made by Co. Services, lead and iron; paid for by Co. and consumer. Meters: 1; owned, controlled and repaired by Co. Pressure, ordinary, 54 lbs. Cap. Stock: Authorized, $25,000; paid-up, $8,500. Bonded debt, $14,000, at 5%; due 1920. Prest., A. W. Snader; Secy., Treas. and Supt., H. K. Storb. Rept. by Secy., June 25, '96.

214. **NEW KENSINGTON,** Westmoreland Co. (5,000.) Built in '93-4 by Burrell Water Co. Des Engrs., Jas. H. Harlow & Co., Pittsburg. Constr. Engr., H. F. Labelle. Contrs., Curran & Hussey and F. R. Dravo & Co., both of Pittsburg. SUPPLY.—Allegheny River, by pumping. PUMPS.—Cap., 3,000,000 galls.; Nordberg cross-comp. cond., fly-wheel. Bituminous coal used. Co. owns mine. FILTERS.—Cap., 3,000,000 galls.; filter crib in bed of river. TANKS.—Three, of wood. REFERENCES.—Filter cribs, May 10, '94, illus.; Nordberg pumps, Feb. 27, '96, illus. and inset.

—? **NEWMANSTOWN,** Lebanon Co. (612.) Built in '92 by Newmanstown Water Co. SUPPLY.—Springs at base of mountain, by gravity from impounding reservoir; also connection with stream at higher altitude. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 2 miles. Taps, 80; made by plumber for $1.50. Services, galv. t.; paid for by Co. to curb, thence by consumers. PRESSURE.—Head of 175 ft. FINANCIAL.—Cost, $6,000 to $7,000. Cap. Stock: Common, authorized, $6,000; all paid-up; paid 6% div'd in '96. Debt, $500, at 5%. Expenses, $162: Operating, $111; int., $30; state taxes, $31. Revenue, all sources, $491. MANAGEMENT.—Prest., Jno. L. Shultz; Treas., N. P. Coldren. Rept. by Secy., Jno. H. Bubp.

215. **NEW MILFORD,** Susquehanna Co. (763.) Built in '92 by New Milford Water Co. Engr., W. B. Gillett. SUPPLY.—Springs and brook, by gravity. FISCAL YEAR CLOSED April 28, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by income. Taps, 80; made by plumbers for $1. Services, galv. t.; paid for by consumer. Meters, 0. Hydrants, 26. PRESSURE.—Ordinary, 140 lbs. FINANCIAL.—Cap. Stock: Authorized, $15,000. Revenue: City, fire protection, $390. MANAGEMENT.—Prest., W. B. Gillett; Secy., F. G. Inderlied; Treas. and Supt., H. B. Carpenter. Rept. by Secy., June 25, '96. SEWERS.—None.

216. **NEW OXFORD,** Adams Co. (585.) Built in '96 by borough; put in operation Aug. 1. Engr., E. M. Kenley, Baltimore, Md. Contrs., Chandley Bros. & Co., Beaver Falls. SUPPLY.—Conewago Creek, pumping to stand-pipe. PUMP.—Cap., 575,000 galls.; Goulds pump, driven by gasoline engine. FILTERS.—Charcoal & sand. STAND-PIPE.—Cap., 120,000 galls.; steel, 16 × 80 ft. DISTRIBUTION.—Taps, made by borough, free. Services, galv. t.; paid for by borough to curb. Hydrants, 21. FINANCIAL.—Cost, about $13,000. MANAGEMENT.—Prest., W. A. Hines; Secy., M. J. Smith; Treas., J. E. C. Miller. Supt., H. H. Diehl. Rept. by Secy., Oct. 3, '96. SEWERS.—None.

217. **NEWPORT,** Perry Co. (1,417.) Built in '93 by Newport Home Water Co.; put in operation Jan., '94. Engr., S. W. Cooper, Millersburg. Contr., H. E. Ahrens, Reading. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes (?). City to pay $600 per yr. for fire protection; 10-yr. contract. No legal difficulties. SUPPLY.—Mountain springs to collecting reservoir, thence by gravity. RESERVOIR.—Cap., 1,000,000 galls.; distributing, about 3 miles from and 260 ft. above town. FISCAL YEAR CLOSED Jan. 1, '94. DISTRIBUTION.—Mains, 7 miles; cost extensions met by income. Taps, 150; made by Co. for $2. Services, galv. t.; paid for by owner or consumer. Meters, 0. Hydrants, public, 25; private, 1. CONSUMPTION.—(Galls.) av., 6,000; max., 7,000; min., 5,000. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock: Authorized, $30,000; paid-up, $6,000. Bonded debt, $30,000, at 5%. Expenses, $1,637: Operating, $60; int., $1,500; taxes, $77. Revenue: City, fire protection, $600. MANAGEMENT.—Prest., P. D. Wanner; Secy. and Supt., B. M. Ely; Treas., Dr. J. B. Ely. Repts., by Secy., Nov. 24, '96; Prest., Jan 18, '97. SEWERS.—None.

218. **NEWTOWN,** Bucks Co. (1,213.) Built in '88-9 by Newtown Artesian Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. No legal difficulties. SUPPLY.—Artesian wells, pumping to reservoir. PUMPS.—Cap., 228,000 (?) galls.; Downie double-acting well pumps. (Makers rept. a 500,000 Worthington simple high-pressure; probably added since last rept. from Co.) RESERVOIR.—Cap., 65,000 galls. FISCAL YEAR CLOSED Jan. 10. DISTRIBUTION.—Mains, 4 miles. Taps, 95. Meters, 0. Hydrants, 23. CONSUMPTION.—(Galls.) av., 40,000. FINANCIAL.—Cost, $24,000. Cap. Stock: Authorized, $20,000; all paid-up. Floating debt, $3,000, at 5%. Expenses, $1,551: Operating, $1,235; int., $150; taxes, $66. Revenue, $1,487: Consumers, $1,200; City, fire protection, $287. NOTE.—No rept. since '90-1 Manual.

219. **NEWVILLE,** Cumberland Co. (1,562.) Built in '95 by Newville Water Co.; put in operation '96. SUPPLY.—Spring, pumping to reservoir. PUMPS.—Cap., 1,000,-

000 galls.; Dean water-power. RESERVOIRS.—Cap., 800,000 galls. DISTRIBUTION.—Mains, 8 miles. Services, w. i. FINANCIAL.—Cost, $40,000. Cap. Stock: Authorized, $20,000. Bonded debt, $20,000, at 5%. MANAGEMENT.—Prest., P. D. Wanner, Reading; Secy., N. C. Freck, Millersburg; Treas., H. E. Ahrens, Reading; Supt., Wm. Best. Rept. by Prest., Jan. 18, '97.

220. **NEW WILMINGTON,** Lawrence Co. (684.) Built in '93 by New Wilmington Water Supply Co. Engr., Prof. S. R. Thompson. Contrs., Chandley Bros., Beaver Falls, and McMillen & Morehead, New Castle. FRANCHISE.—999 yrs. from '92. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay $320 a yr. for fire protection; 10-yr. contract. No legal difficulties. SUPPLY.—Natural springs (covered) by gravity. Co. owns 12 acres around springs. RESERVOIRS.—Cap., 490,000 galls. Two; one of 40,000, located inside of a 550,000 reservoir, used only in case of fire, smaller on is covered by roof. FISCAL YEAR CLOSED Jan., '96. DISTRIBUTION.—Mains, 2 miles; cost extensions met by income. Taps, 50; made by Co. for $10, including service to curb. Services, lead; paid for by property owner from curb. Meters, 0. Hydrants, public, 22; private, 8 or 10. CONSUMPTION.—Unknown. PRESSURE.—65 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $7,000; all paid-up; paid 3% div'd in '95. Debt: Floating, $800, at 6%; bonded, $6,000, at 6%, due in 1903. Sinking Fund: $250. Expenses, $624: Operating, $205; int., $360; taxes, $59. Revenue, $820: Consumers, $500; City, fire protection, $320. MANAGEMENT.—Secy., R. G. Ferguson; Treas., Wm. A. Clark; Supt., Wm. A. Clark, Jr. Rept. by Treas., Dec. 1, '96. SEWERS.—Only partial private sanitary sewers.

D 18. **NICHOLSON,** Wyoming Co. (734.) Built in '92 by Nicholson Water Co. for domestic supply. Supply, Horton Brook, by gravity from impounding reservoir. Rept. by N. P. Wilcox, Aug. '96.

185. **NOBLE** (P. O. Jenkintown), Montgomery Co. See Jenkintown.

221. **NORRISTOWN,** Montgomery Co. (19,791.) Built in '47 by Norristown Insurance & Water Co. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay nothing for hydrants. No legal difficulties. SUPPLY.—Schuylkill River, pumping to reservoir. PUMPS.—Cap., 7,500 000 galls.; 5,000,000 Worthington high-duty; 2,500,000 slide valve, make not given. Anthracite pea coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 11,000,000 galls.; storage and distributing. FISCAL YEAR CLOSED March, '96. DISTRIBUTION.—Mains, 35 miles; cost extensions met by income. Taps, made by Co. for $2.50. Services, lead; paid for by consumer. Meters: 175; owned and controlled by Co.; repaired by consumer. Use of meters compulsory for hotels, liveries, factories, etc. Co. can compel use of meter and any consumer may have one. Hydrants, public, 250; private, 5. CONSUMPTION.—(Galls.) av., 2,250,000; max., 3,000,000; min., 2,000,000. PRESSURE.—Ordinary, 30 to 88 lbs. Three steam fire engines are used. FINANCIAL.—Cost, $340,000. Cap. Stock: Paid-up, $300,000; paid 8% div'd in '96. Sinking Fund: $16,000, invested in various securities. MANAGEMENT.—Prest. and Supt., J. Slingluff; Secy., H. C. Crawford; Treas., W. H. Slingluff; Ch. Pump. Engr., R. A. Jackson. Rept. by Prest., June 8, '96. SEWERS.—Projected. REFERENCE.—Eng. News, Jan. 7, '82.

222. **NORTH CLARENDON,** Warren Co. (1,747.) Built in '81 by Brown Bros., owned by Elston estate. SUPPLY.—Deep well, pumping direct. PUMP.—Wheeler & Tappan deep well. DISTRIBUTION.—Mains, 1½ miles. Taps, 90; made by Co. Services, iron; paid for by consumer. Meters, 0. Co. can compel use of meter and any consumer may have one. Hydrants, 10. CONSUMPTION.—(Galls.) av., 45,000. PRESSURE.—Ordinary, 20 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $5,500. Expenses: Operating, $1,450. Revenue: Consumers, unmetered, $1,650. MANAGEMENT.—Mgr., W. R. Elston; Supt., A. F. Crossman. Rept. by Supt., June 8, '96. PROJECTED IMPROVEMENTS.—Compulsory metering of services. SEWERS.—None.

223. **NORTH EAST,** Erie Co. (1,588.) Built in '86 by borough. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 3,500,000 galls. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains, 8 miles; cost extensions met by income. Taps, 450; made by Co. free. Services, galv. i.; paid for by owner. Meters: 12; owned, controlled and repaired by borough. Use of meters optional with Co. only; compulsory for factories, hotels, stables, laundries. Hydrants, public, 45; private, 1. CONSUMPTION.—(Galls.) av., 150,000; max.; 200,000; min., 100,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $20,000, at 5%; due 1910. Expenses, $1,500: Operating, $500; int., $1,000. Revenue, $4,000: Consumers, $3,400; City, fire protection, $600. MANAGEMENT.—Prest., O. W. Davis; Secy. and Supt., J. N. Leet; Treas., Short Banking Co. Rept. by Secy., June 6, '96. PROJECTED IMPROVEMENTS.—Increase in supply. SEWERS.—None.

224. **NORTHUMBERLAND,** Northumberland Co. (2,744.) Built in '94 by Northumberland Water Co.; put in operation Jan. 1, '95. Engr., S. W. Cooper, Millersburg. Contr., H. E. Ahrens, Reading. FRANCHISE.—Perpetual. Hydrant rental (in '94), $900 per yr. for 33; 5-yr. contract. No legal difficulties. SUPPLY.—Mountain stream and water flowing from an abandoned iron mine, by gravity. RESERVOIR.—Cap., 2,000,000 galls.; formed by dam. DISTRIBUTION.—Mains, 11 miles. Taps, 170. Services, galv. i.; paid for by consumer. Hydrants, 33. PRESSURE.—67 lbs. FINANCIAL.—Cap. Stock: Common authorized, $40,000. MANAGEMENT.—Prest., F. R. Van

Alen; Secy., W. A. Starick; Treas., W. B. Waples. Rept. by S. W. Cooper, Des. Engr., Dec., 29, '96.

225. **NORTH WALES,** Montgomery Co. (1,060.) Built in '86-8 by North Wales Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to $7.50 per hydrant per yr. No legal difficulties. SUPPLY.—Artesian wells, pumping through main to tanks. PUMPS.—Cap., 250,000 galls.; Gordon-Maxwell and Dyer-Cooper. Anthracite buckwheat coal used; av. cost, $1.95 per short ton. TANK.—Cap., 55,000 galls.; cedar, 8 × 15 ft., on 16 ft. stone piers; top, 131 ft. above lowest part of town. FISCAL YEAR CLOSED Nov. 7, '95. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by reserve fund. Taps, made by plumber. Services, lead; paid for by owner. Meters, 0. Hydrants, 25. PRESSURE.—Ordinary, 50 to 100 lbs. FINANCIAL.—Cost, $19,363. Cap. Stock: Authorized, $16,000; all paid-up; paid 6% div'd in '95. Expenses, $1,124; taxes, $114. Revenue: City, fire protection, $187. MANAGEMENT.—Prest., E. K. Freed; Secy. and Supt., F. S. Kriebel; Treas., A. K. Shearer. Rept. by Secy., Aug. 10, '96. SEWERS.—None.

299. **NORWOOD,** Delaware Co. See Swarthmore.

299. **OAKEOLA** (No P. O.) Delaware Co. See Swarthmore.

226. **OAK LANE** (P. O. Ashbourne), Montgomery Co. (Not given.) Built in '95 by Oak Lane Water Co.; put in operation in March. Supplies also: Melrose, Ashbourne, La Mott and a portion of 22d Ward of Philadelphia. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. SUPPLY.—Deep wells, pumping to stand-pipe. Wells are 550 ft. deep. PUMPS.—Cap., not given; Philadelphia Corliss engine and two deep well power pumps. Anthracite pea coal used. STAND-PIPE.—Cap., 397,000 galls.; 30 × 75 ft. DISTRIBUTION.—Mains, 25 miles. Taps, 212; made by Co. for $3.50. Services, lead and iron; paid for by consumer. Meters: 212; owned and controlled by Co.; repairs paid by consumer. Use of meters compulsory for all services. Hydrants, public, 25; private, 3. PRESSURE.—Ordinary, 40 to 80 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., N. B. Cox; Secy., H. B. Hodge; Treas., Jno. W. Hawley; Supt., C. A. Buck. Rept. by Am. Pipe Mfg. Co., Philadelphia, June 8, '96.

185. **OGONTZ,** Montgomery Co. See Jenkintown.

227. **OIL CITY,** Venango Co. (10,932.) Built in '72 by city. SUPPLY.—Allegheny River and springs, pumping to reservoir and tanks. (In '89 spring supply was rept. as by gravity.) PUMPS.—Cap., 7,000,000 galls.: 3,000,000 Snow; 2—500,000 Eclipse; 3,000,000 Wilson & Snyder. Gas used; at cost 9 cents per 1,000 cu. ft. RESERVOIR.—Cap., 3,000,000 galls.; distributing, 310 ft. above city. TANKS.—Cap., 800,000 galls.; four. FISCAL YEAR CLOSED April 1, '96. DISTRIBUTION.—Mains, 18 miles; cost extensions met by income. Taps, 1,660; made by city. Services, lead; paid for by consumer. Meters: 355; owned by consumer; controlled and repaired by city. Use of meters compulsory for factories and liveries. City can compel use of meter and any consumer may have one. Hydrants, public, 143; private, 3. CONSUMPTION.—(Galls.) av., 3,000,000; max., 3,500,000; min., 2,500,000. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $248,700. Bonded debt, $54,000, at 5%. Sinking Fund: $10,000, not invested. Expenses: Operating, $11,996; int., $2,850. Revenue, $25,707: Consumers, unmetered, $17,676; metered, $8,031. MANAGEMENT.—Prest., Alfred Smedley; Secy., A. M. Breckinridge; Treas., W. H. Wise; Supt., M. F. Johnston; Ch. Pump. Engr., C. Brown. Rept. by Secy., July 24, '96. PROJECTED IMPROVEMENTS.—Driven wells supply, near river. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 22, '82.

337. **OLD FORGE TOWNSHIP,** Lackawanna Co. (4,422.) See Spring Brook Water Supply Co., Wilkes-Barre.

228. **OLYPHANT,** Lackawanna Co. (4,083.) Built by Olyphant Water Co.; put in operation Jan. 1, '90. SUPPLY.—Mountain stream by gravity to and from reservoir. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 300. Meters, 20. Hydrants, 20. PRESSURE.—Ordinary, 140 lbs.; fire, 175 lbs. FINANCIAL.—Bonded, $37,500, at 6%. Expenses: Operating, $100. Revenue: Consumers, $3,500; City, $500. MANAGEMENT.—Prest., Jas. Jordon; Secy., Jas. J. Lynch; Treas., Jno. T. Richards. NOTE.—No rept. since '90-1 Manual.

P 28. **ORBISONIA,** Huntingdon Co. (963.) Co. has charter but will do nothing "until after times get better." Rept. by R. F. Ripple, Secy and Treas., Aug. 8, '96.

229. **ORWIGSBURGH,** Schuylkill Co. (1,290.) Built in '85 by borough. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.—Cap., 32,000,000 galls.: 2—1,000,000, impounding; 30,000,000, storage. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by income. Taps, 350; made by city, free, including service to curb. Services, lead and galv. i.; paid for by consumer to curb. Meters: 3; owned, controlled and repaired by city. Use of meters optional with city; compulsory for railroads and motors. Hydrants, 32. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 80 lbs. One steam fire engine is used. FINANCIAL.—Cost, $30,000. Bonded debt, $16,000, at 4%. Revenue, $2,550: Consumers, unmetered, $2,363; metered, $187. MANAGEMENT.—Prest. of Council, H. D. Koch; Treas., Geo. W. Garret; Supt., M. E. Campbell. Rept. by Supt., June 10, '96. SEWERS.—None.

230. **OSCEOLA MILLS,** Clearfield Co. (1,730.) Built in '89 by Osceola Water Supply Co.; put in operation Dec. 4. FRANCHISE.—20 yrs. SUPPLY.—Mountain streams, by gravity from impounding reservoir. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION. —Mains, 6½ miles. Taps, 304. Services, ½, ¾ and 1-in. iron. Meters, 0. Hydrants, 26. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $29,000. Cap. Stock, common, authorized, $26,000; all paid-up. No debt. Expenses: Operating, $450. Revenue: Consumers, $2,566. Borough, fire protection, $410. MANAGEMENT.—Prest., T. C. Helms; Secy., A. S. R. Richards; Treas., C. R. Houts; Supt., Hugh Campbell. Rept. by Secy., Jan. 19, '97. SEWERS.—Has sewers.

37. **OVERBROOK,** Montgomery Co. See Bryn Mawr.

231. **OXFORD,** Chester Co. (1,711.) Owned by borough. Built in '68 by Oxford Gas & Water Co. Bought in '70 by borough for $30,000. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—Cap., 115,000 galls.; two Knowles. RESERVOIR.—Cap., 500,000 galls.; 80 ft. sq. at top; 74 ft. above town. FISCAL YEAR CLOSED March 5. DISTRIBUTION.—Mains, 4 miles. Taps, 131. Services, lead. Meters, 0. Hydrants, 25. FINANCIAL.—Cost, $45,437. Bonded debt, $39,700: $12,200 at 4½%; $27,500, at 4%; due in 1906. Expenses, $3,149: Operating, $1,195; int., $1,954. Revenue, $1,727. MANAGEMENT.—Three Comrs.; Chn., J. King; Secy. Council, J. C. Kerr. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 3, '83.

D 19, D 20. **PALMYRA,** Lebanon Co. (768.) Two domestic plants: One owned by Co. with cap. stock of $5,000; other owned by individual. Each has reservoir. Place not an incorp. municipality. Rept. by S. A. Kiefer, Notary Public, Sept., '96.

253. **PALO ALTO** (P. O., Pottsville), Schuylkill Co. (1,424.) Supply from Pottsville.

25. **PAOLI,** Chester Co. (253.) See Berwyn.

232. **PARKESBURG,** Chester Co. (1,514.) Built in '89-90 by Parkesburg Water Co.; put in operation June 1. SUPPLY.—Artesian well, pumping to reservoir. PUMPS.—Driven by wind-mill. RESERVOIR.—Cap., about 290,000 galls. DISTRIBUTION.—Mains, Mains, 8 to 6-in. Taps, 14. Hydrants, 12. FINANCIAL.—Cost, about $21,000. Cap. Stock: Authorized, $20,000; all paid-up. Floating debt, $1,300, at 5%. Expenses: Operating, $375. Revenue: Consumers, $100; City, $1,300. SEWERS.—Is partially sewered. NOTE.—No rept, since '90-1 Manual.

233. **PARKER CITY** (P. O., Parkers Landing), Armstrong Co. (1,317.) Built in '72 by Parkers Landing & Laurenceburgh Water Co. SUPPLY.—Allegheny River, pumping to tanks. PUMPS.—Cap., 300,000 galls.; Cameron. Bituminous slack coal used. TANKS. —Cap., 12,000 galls.; wood. FISCAL YEAR CLOSED Jan., '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income. Taps, 250; made by Co., free. Services, galv. i.; paid for by consumer. Hydrants, 25. CONSUMPTION.—(Galls.) av., 8,000. PRESSURE.—Ordinary, 75 lbs.; fire, 160 lbs. FINANCIAL.—Cap. Stock: Authorized, $10,000; paid-up, $5,000. Revenue: City, fire protection, $140. MANAGEMENT.—Prest., O. Tinsman; Secy., R. M. Moore; Treas., D. W. Fullerton; Supt., Jno. Walker. Rept. by Supt., Aug. 10, '96. SEWERS.—None. REFERENCE.—Eng. News, June 7, '84.

337. **PARSONS,** Luzerne Co. (2,412.) See Spring Brook Water Supply Co., Wilkes-Barre.

234. **PATTERSON,** Juniata Co. (826.) Built in '92 by Patterson Water Co.; put in operation Oct. 8. Engr., V. C. Freck, Millersburg. Contrs., Mellert Foundry & Machine Co., Reading. FRANCHISE.—10 yrs. from '93. City to pay $2.40 per yr. for fire protection. No legal difficulties. SUPPLY.—From Mifflintown Water Co. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 2 miles; cost extensions met by income. Taps, 150; made by plumbers. Services, galv. i.; paid for by consumer. Meters: 1; owned by consumer; controlled by Co. Hydrants, 8. CONSUMPTION.—Unknown. PRESSURE. —Ordinary, 80 lbs. Steam fire engines are seldom used. FINANCIAL.—Cap. Stock: Authorized, $10,000. Floating debt, $4,500, at 6%; bonded, $7,500, at 5%; due 1912. Expenses, $784: Operating, $79; int., $665; taxes, $40. Revenue, $1,388: Consumers, unmetered, $1,148; City, fire protection, $240. MANAGEMENT.—Prest., L. Banks; Secy., R. E. Parker; Treas., T. V. Irwin; Supt., H. D. Funk. Rept. by Treas., Mifflintown, Aug. 10, '96. SEWERS.—None.

235. **PATTON,** Cambria Co. (Not given.) Built sometime between '93 and '95 by Patton Water Co. for general supply. Co. was incorp. in '93 with cap. stock of $10,000. CONTRACT.—Hydrant rental, $20 each per yr. for 12. SUPPLY.—Surface water (?). In '96 Co. started to build second reservoir and proposed to put in pump and filter. MANAGEMENT.—Supt., E. C. Brown. Information, press repts., except regarding incorp.

236. **PAXTANG** (P. O. Harrisburg), Dauphin Co. (Not given.) Built in '95 by Paxtang Water Co. Contrs., Michigan Pipe Co., Bay City, Mich. SUPPLY.—Well, pumping to tank. FINANCIAL.—Cap. Stock (in '95), authorized, $3,000. MANAGEMENT.—Prest., Reuben Landermilch. Rept. by Secy., J. N. Rohrer, Nov., '96.

237. **PECKVILLE,** Lackawanna Co. (1,095.) First supplied in '70 by Co. In '89-90 both Archbald and Olyphant Water Cos. laid mains. In '90 the three Cos. consolidated as Archibald Water Co. and Olyphant Co.'s mains were taken up. Jan. 1, '95, Archibald Water Co. bought out Peckville Water Supply Co., by equal exchange of stock. Press rept. Apr. 23, '96, stated $24,000 bonds had been

voted for municipal works. SUPPLY.—Two creeks and lake by gravity. FISCAL YEAR CLOSED Oct. 1, '96. DISTRIBUTION.—Taps, made by Co. for $3. Services, galv. t.; paid for by consumer. Hydrants, 16. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—See Archbald. MANAGEMENT.—Rept. by Supt., S. W. Arnold. SEWERS.—None.

238. **PEN ARGYL,** Northampton Co. (2,106.) Built in '89 by Pen Argyl Water Co. Press repts. Aug., '94, stated borough had accepted Co.'s offer to sell it the plant for $30,000. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. Hydrant rental, $25 each. SUPPLY.—Spring, by gravity. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 3½ miles. Hydrants, 20. MANAGEMENT.—Secy., Treas. and Supt., W. H. Sanger. NOTE.—No rept. since '90-1 Manual.

110. **PENN** (No P. O.), Westmoreland Co. (931.) See Greensburgh.

239. **PENNSBURG,** Montgomery Co. (627.) Pennsburg Water Co. incorp. Nov. 2, '96, and let contracts for works in Dec. Contr., Bolton G. Coon, Kingston. Borough voted in June, '96, to build works, but could not legally incur necessary debt. Jos. H. Young, 4618 Chester Ave., Philadelphia, was Engr., for either the proposed boro. plant or the Co. SUPPLY.—From reservoir. DISTRIBUTION.—Mains, 7 miles. MANAGEMENT.—Address Jonathan P. Hillegas, one of the incorp. Information from new incorp. repts. and Contr.

338. **PENN TOWNSHIP,** Allegheny Co. (2,932.) Supply for part or all of township from Wilkinsburg.

240. **PERKASIE,** Bucks Co. (458.) Built in '95 or '96 by Perkasie Water Co. for general supply. SUPPLY.—Rock Hill Springs, by gravity. FINANCIAL.—Est. cost, $25,000. Cap. Stock: Authorized, $20,000. MANAGEMENT.—(Apr., '95), Treas., J. A. Hendricks. Rept. from citizen and new incorp. returns.

241. **PETROLIA,** Butler Co. (546.) Owned by T. Keighron; built in '74 by Co.; bought in '80 by Petrolia Water-Works Co. SUPPLY.—Artesian well, pumping to tank for domestic use and direct for fire protection. PUMPS.—Cap., 38,400 galls.; two Blake. TANK.—Cap., 48,000 galls.; 175 ft. above city. DISTRIBUTION.—(In '89.) Mains, 1 mile. Taps, 30. Meters, 0. Hydrants, 20. CONSUMPTION.—(Galls.) av., 1,600. PRESSURE.—Ordinary, 30 lbs.; fire, 150 lbs. FINANCIAL.—Cost (in '82), $8,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 6, '83.

242 (123, 300.) **PHILADELPHIA,** Philadelphia Co. (1,046.964) Built in 1800-1 by city. In '66 and '73, city became owner of works built in '51 and '60 by different Cos. to supply Germantown and Chestnut Hill, respectively. (Holmesburg and Tacony are within city limits and each has works owned by Co. described under those places.) SUPPLY.—Schuylkill and Delaware Rivers and springs, pumping to reservoirs and direct; main supply from Schuylkill River. High service, pumping from reservoir to stand-pipe. PUMPS.—Cap., main stations, 380,790,000 galls.: 345,790,000 from Schuylkill, and 35,000,000 from Delaware River. Supplementary stations, 11,250,000 galls. Fairmount: 1—2,000,000, 3—5,100,000 and 8—5,300,000 water power. Spring Garden: 2—30,000,000 Holly vert. triple exp. and 1—20,000,000 Gaskill; 2—15,000,000 and 1—10,000,000 Worthington comp. cond.; 1—20,000,000 Southwark; 1—20,000,000 Cramp comp. rotary; 1—10,000,000 Simpson comp. rotary. Belmont: 2—5,000,000 and 1—8,000,000 Worthington comp. cond. and 1—20,000,000 Worthington hor. comp. high duty. Queen Lane: 4—20,000,000 Southwark. Roxborough: 1—12,000,000 Southwark; 1—5,000,000 and 1—7,500,000 Worthington comp. cond. All above take water from Schuylkill River. Frankford (Delaware River): 1—10,000,000 Cramp; 1—10,000,000 Wetherill; 1—15,000,000 Southwark. Four Supplementary Stations: 2—1,000,000 Davidson; 1—500,000 Snow; 1—1,000,000 Knowles; 1—2,000,000 and 1—500,000 Worthington comp. cond. Buckwheat and pea coal used; av. cost: Buckwheat, $1.76; pea, $2.42 per short ton.

RESERVOIRS.—Cap., 1,417,860,000 galls.; 11 reservoirs. Fairmount: 26,350,000; four basins; elev., 94 ft. Corinthian: 37,341,000, elev., 120 ft. Spring Garden: 12,950,000, elev., 120 ft. East Park: 688,618,000; three basins; elev., 133 ft. Queen Lane: 383,100,000; two basins; elev., 238 ft. Belmont: 39,758,000; elev., 212 ft. Mount Airy: 4,546,000; elev., 363 ft. Roxborough: 12,838,000; elev., 366. New Roxborough: 147,032,000; two basins; elev., 414 ft. Frankford: 86,046,000; elev., 167 ft. Lehigh: 28,910,000; two basins; elev., 114 ft. STAND-PIPES.—Cap., 106,000 galls.; two, 11 × 150 ft., each. TANKS.—Cap., 159,000 galls.; elevated. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 1,174 miles; cost extensions met by taxation and loans. Taps, for '90, 170,911; added since '90, 50,949, according to annual report for '95; No. of taps discontinued, not given; made by city for $2 to $14. Services, lead and iron. Meters, 1,273; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city, in some cases, and large users may have them. Hydrants, 10,038. CONSUMPTION.—(Galls.) av., 215,000,000; max., 230,000,000; min., 195,000,000. PRESSURE.—Steam fire engines are used. FINANCIAL.—Cost, $28,000,000. Expenses: Operating, $1,113,470. Revenue: Consumers, unmetered, $2,483,150; metered, $132,989. MANAGEMENT.—Director Pub. Wks., Thos. M. Thompson; Chief of Bureau of Water, Jno. C. Trautwine, Jr.; Supt., F. L. Hand. Rept. by Jno. C. Trautwine, June 17, '96. PROJECTED IMPROVEMENTS.—Filtration of supply. SEWERS.—Has combined system of sewers. REFERENCES.—Engineering News, March 14, June 18, '78; May 31, '79; March 12, 19, 26, '81; Oct. 21, '82; table of cost of maintenance, Dec. 9, '82; Dec, 28, '82; June 9, '83; April 16, '87; report of pumping engines, Feb. 18, '88; break in Conshohocken Reservoir, Aug. 18,

'88; discussion of future supply, March 20, '80, Nov. 24 and Dec. 8, '92, Oct. 5, '93; Worthington high duty pumps, April 20, '93, illus. and inset; pump, Oct. 11, '94, with inset; Queen Lane Reservoir, Aug. 15 and Oct. 24, '95, illus.; history, Feb. 27, '96, illus.; Queen Lane and Roxboro Reservoir, March 12, '96; filtration, March 19 and Oct 1, '96.

243. **PHILLIPSBURGH,** Centre Co. (3,245.) Built in '81 by Phillipsburgh Water Co. FRANCHISE.—99 yrs. from '81. Rates not subject to regulation by city. City to pay $15 per yr. per hydrant. No legal difficulties. SUPPLY.—Cold stream, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup. Bituminous coal used; av. cost, $1 per short ton. RESERVOIRS.—Total cap. not given; impounding dam, cap. not given; area, 20 acres; distributing, cap., 500,000. FISCAL YEAR CLOSED June 9, '96. DISTRIBUTION.—Mains, 5 miles. Taps, 500; made by Co. for $5, including service to curb. Services, galv. i.; paid for by Co. to curb. Meters, 4; owned and controlled by Co. Use of meters optional with consumer; compulsory for hospital, schools and laundries. Hydrants, public, 47; private, 2. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $60,000. Cap. Stock: Authorized, $60,000; all paid-up; paid 8% div'd in '96. No debt. Expenses, $5,329: Operating, $4,989; taxes, $340. Revenue: Consumers, $10,082; City, fire protection, $745. MANAGEMENT.—Prest., J. W. Casanova; Secy., Wm. M. Potter; Treas., O. P. Jones; Supt., C. N. Humphrey; Ch. Pump. Engr., P. Sterrett. Rept. by Prest., July 13, '96. SEWERS.—Has sanitary and storm sewers.

244. **PHOENIXVILLE,** Chester Co. (8,514.) Built in '72-3 by borough. SUPPLY.—Schuylkill River, pumping to reservoir. PUMPS.—Cap., 3,000,000 galls.; Worthington, 1,000,000 and 1,500,000 comp. cond. and 500,000 high pressure. (Rept. by makers). Force main rises 195 ft. RESERVOIR.—Cap., 2,521,000 galls. DISTRIBUTION.—Mains, 13 miles. Taps, 1,000. Meters, 4. Hydrants, 150. CONSUMPTION.—(Galls.) av., 800,000. FINANCIAL.—Cost, $195,000. Bonded debt, $188,200, at 5%. Sinking Fund, $760. Expenses, $17,730: Operating, $7,806; int., $9,377; state tax, $546. Revenue: Consumers, $20,589; City, fire protection, $6 per hydrant. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Sept. 10, '81.

245. **PINEGROVE,** Schuylkill Co. (2,601.) Built in '93 by borough; put in operation Oct. 1. Engr., Fred. C. Dunlap; Contrs., Levering & Vandergrift, all of Philadelphia. SUPPLY.—Spring, by gravity. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Dec. 15, '95. DISTRIBUTION.—Mains, not given; cost extensions met by rentals. Taps, 235; made by borough for $5.75, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 1; owned and repairs paid for by consumer; controlled by borough. Use of meters optional with consumer. Hydrants, 24. PRESSURE.—Ordinary, 70 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $21,000. Sinking Fund, $290. Revenue: Consumers, unmetered, $1,200. Operating expenses are met by water rents; bonded debt and int. paid by taxes. MANAGEMENT.—Prest., P. L. Filbert; Secy., F. B. Wheeler; Treas., J. F. Wernts. Supt. W. M. Druckenmiller. Rept. by Supt., Dec. 7, '96. SEWERS.—None.

78. **PITCAIRN,** Allegheny Co. See East Pittsburg.

246, 247, 248. **PITTSBURG,** Allegheny Co. (238,617.)

CITY PLANT.

Built in '26; rebuilt in '42-4 and '72-8. SUPPLY.—Allegheny River, pumping to reservoir. PUMPS.—Originally 4 modified crank type, designed for 20,000,000 each, but never pumped over 15,000,000 each. Later added 2—10,000,000 Holly vert. cross-comp. high duty. Now taking out two Lowry and putting in their place 4—12,000,000 Allis vert. comp. high duty. (Makers rept. 2—5,000,000 Allis vert. triple exp. at later date.) Bituminous coal used; av. cost, $1.30 per short ton. Force main (in '89), 50-in., rising 365 ft. in 3,840. RESERVOIRS.—Cap., 117,000,000 galls. FISCAL YEAR CLOSED Jan. 31, '95. DISTRIBUTION.—Mains, 272 miles; cost extensions met by appropriations. Taps, 26,693; made by city for $3.50. Services, lead; paid for by property owner. Meters, 124; owned and repairs paid by consumer; controlled by city. Use of meters optional with city; compulsory for large consumers. Hydrants, 2,143. CONSUMPTION.—(Galls.) av., 47,000,000; max., 60,000,000; min., 42,000,000. PRESSURE.—Ordinary, 25 to 125 lbs. Steam fire engines are used. FINANCIAL.—(In '89.) Cost, $4,582,000. Bonded debt (in '89), $4,582,500; $4,282,500 at 7%; $300,000 at 6%. Sinking Fund (in '89), $1,356,083. Expenses: Operating (in '95), $250,000; int., $317,775. Revenue, $541,909. MANAGEMENT.—Supt., A. B. Shepherd; Ch. Pump. Engr., J. J. Brennan. Rept. by Supt., Nov. 27, '96. SEWERS.—Has sanitary and storm sewers.

MONONGAHELA WATER CO.

Built in '65. Supplies South Side (part of Pittsburg), McKee's Rocks, Esplen, Elliot, Sheridan, Ingram, Crafton, Carnegie, Knoxville, Beltzhoover, Mount Oliver and West Liberty. FRANCHISE.—Exclusive, until Co. pays 8% div'd for five consecutive years. Rates are required to be the same as in the city of Pittsburg. Co. is exempt from local taxes. Fire hydrants free to city. No legal difficulties. SUPPLY.—Monongahela River, by pumping. PUMPS.—Cap., 41,000,000 galls.: 2—3,000,000 Wilson & Snyder; five Worthington, of which two are 10,000,000 non-comp. non-cond. Bituminous slack used; av. cost, 58 cts. per short ton. FILTERS.—Filtering cribs. RESERVOIR.—Cap., 5,000,000.

galls.; distributing. TANKS.—Three, cap., 1,100,000 galls. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 124 miles; cost extensions met by stock. Taps, 10,880; made by Co. for $3.50. Services, lead; paid for by consumer. Meters, a few; owned and repaired by consumer; controlled by Co. Hydrants, not given. CONSUMPTION.—(Galls.) av., 14,000,000; max., 16,000,000; min., 12,000,000. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cap. Stock: Authorized, $2,000,000; paid 7½% div'd in '95. Bonded debt, $100,000. Expenses: Operating, $39,000. Revenue, $200,000. MANAGEMENT.—Prest., M. W. Watson; Secy. and Supt., M. Prenter; Treas., H. Stamm; Ch. Pump. Engr., S. Rameden. Rept. by Secy., July 13, '96. SEWERS.—Part of territory supplied has sanitary or storm sewers. REFERENCES.—Eng. News, June 11, 18, '81; filtration, Nov. 2, '93, May 10, '94 and Dec. 12, '95, illus.

ST. CLAIR WATER CO.

Built in '94-5; put in operation Apr. 1. Engr., Jacob Schinneller, Pittsburg. Supplies six boroughs adjoining and near Pittsburg. (Some of the territory is supplied by Monongahela Water Co., see above, and it is rept. that arrangement has been made for consolidation of interests in some of the territory, under name Chartiers Water Co.—Ed.) SUPPLY.—Filter cribs in Monongahela River, pumping to reservoir and tanks. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Worthington vert. comp., a high duty and a cond. RESERVOIR.—Cap., 3,000,000 galls. TANKS.—Cap., 1,500,000 galls.; two. DISTRIBUTION.—Mains, 50 miles. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $900,000. Cap. Stock: Authorized, $500,000; all paid-up. Bonds: Authorized, $500,000; issued, $400,000, at 6%. Expenses: Operating, $12,000. Revenue, $40,000. MANAGEMENT.—Prest., J. F. Grimes, Knoxville; Secy., W. W. Murray; Treas., A. C. Robinson; Supt., W. J. Hunter. Rept. by Prest., Feb. 22, '97. SEWERS.—None in territory supplied.

249, 337. **PITTSTON,** Luzerne Co. (10,302.) Now owned by Peoples' Water Co.; controlled by Spring Brook Water Supply Co., Wilkes-Barre. Built in '55-7 by Pittston Water Co. Supplies West Pittston. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Susquehanna River, pumping to reservoirs. PUMPS.—Cap., 7,800,000 (?) galls.: 1,800,000 Worthington comp. cond.; 1,000,000 Knowles; 5,000,000 Holly-Gaskill rotative. (First two are old pumps, rept. for '89-90 Manual. Last one rept. by makers.) RESERVOIRS.—Cap., 2,500,000 galls.: 2,000,000, 166 ft. above pumps; 500,000, 191 ft. above pumps. DISTRIBUTION.—(In '87.) Mains, 21 miles. Taps, est., 1,900. Hydrants (in '90), public, 35. NOTE.—No separate rept. since '90-1 Manual. See Spring Brook Water Supply Co., Wilkes-Barre. REFERENCE.—Eng. News, Apr. 15, '82.

337. **PLAINS,** Luzerne Co. (Township, 6,576.) Supply, from Spring Brook Water Supply Co., Wilkes-Barre.

194. **PLEASANT VALLEY,** Bucks Co. Supply from Moosic.

250, 337. **PLYMOUTH,** Luzerne Co. (9,344.) Built in '75-6 by Plymouth Water Co.; now controlled by Spring Brook Water Supply Co.; see Wilkes-Barre. FRANCHISE.—Provides for purchase of works by city after 20 yrs. Rates not subject to regulation by city. SUPPLY.—Streams and artesian wells, pumping to reservoirs. PUMPS.—Vulcan Iron Co. and Barr. Anthracite buckwheat coal used; av. cost, $1 per short ton. RESERVOIRS.—Five. Cap., 20,000,000 galls.; three storage, 19,000,000; two distributing, 700,000. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 30 miles; cost extensions met by income. Taps, made by plumbers, free. Services, galv. i.; paid for by owner. Meters, 10; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for factories. Hydrants, public, 48; private, 1. CONSUMPTION.—(Galls.) av., 3,000,000; max., 4,000,000; min., 2,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 110 lbs. FINANCIAL.—Cap. stock: Authorized, $150,000; all paid-up; paid 12% div'd in '95. Expenses, taxes, $750. MANAGEMENT.—Prest., P. Shupp; Secy., J. A. Opp; Treas., A. K. Dewitt; Supt., W. P. Davenport; Ch. Pump. Engr., Geo. Platt. Rept. by Supt., July 13, '96; also see Spring Brook Water Supply Co., Wilkes-Barre. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Apr. 24, '86.

251. **PORT ALLEGANY,** McKean Co. (1,230.) Built in '85-6 by Allegany Water Co. FRANCHISE.—Perpetual. Provides for purchase of works by city after 20 yrs. Co. is exempt from local taxes. City to pay $250 per yr. for 21 hydrants. LEGAL DIFFICULTIES.—Borough restrained from levying special tax, under act of '76, which was declared unconstitutional. SUPPLY.—Mountain streams, by gravity. RESERVOIRS.—Cap., 800,000 galls.; two. FISCAL YEAR CLOSED May 1, '95. DISTRIBUTION.—Mains, not given; cost extensions met by income. Services, galv. i.; paid for by owner. Meters, 0. Use of meters optional with Co. Hydrants, private, 2. FINANCIAL.—Cost, $29,000. Cap. Stock: Authorized, $10,000; all paid-up. MANAGEMENT.—Prest., Thos. McDowell; Secy., S. W. Smith; Treas., J. H. Williams; Supt., Wm. E. Smith. Rept. by Supt., Sept. 14, '96. SEWERS.—None.

258. **PORT CARBON,** Schuylkill Co. (1,976.) Supply from Pottsville.

78. **PORT PERRY,** Allegheny Co. (1,081.) Supply from East Pittsburg.

P 24. **PORT VUE** (P. O., Pittsburg ?), Allegheny Co. (Not given.) Projected by Co. Boro. has granted 20-yr. franchise, with provision for purchase by boro. at expiration. Rates are fixed in franchise. Co. is exempt from local taxes for 10 yrs. Boro. to

pay $35 per hydrant per yr. Supply will be from Elizabeth Water Co. (see Elizabeth). Rept. by Secy. and Treas., Jno. P. McIntyre, McKeesport. No sewers.

252. **POTTSTOWN,** Montgomery Co. (13,285.) Built in '69-71 by Pottstown Gas & Water Co. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Schuylkill River, pumping to reservoirs. PUMPS.—Cap., 5,500,000 galls.: 1,500,000 Worthington comp. cond.; 4,000,000 Barr comp. dup. RESERVOIRS.—Cap., 6,500,000 galls.; two distributing; 5,000,000 and 1,500,000. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains, 23½ miles. Taps, made by Co. for $2. Services, lead; paid for by consumer. Meters, few; owned by consumers. Hydrants, '99. CONSUMPTION.—(Galls.) av., 900,000. PRESSURE.—Ordinary, 40 to 50 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $225,000; all paid-up. MANAGEMENT.—Prest., Geo. B. Lessig; Secy. and Treas., J. H. Maxwell; Supt., F. T. Slonaker. Rept. in '96. REFERENCE.—Eng. News, Mar. 18, '82.

253. **POTTSVILLE,** Schuylkill Co. (14,117.) Built in '34-6 by Pottsville Water Co. Supplies St. Clair, Port Carbon, Palo Alto, Mount Carbon and Yorkville. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes, but pays state taxes. No compensation for public service has ever been asked. No legal difficulties. SUPPLY.—Mountain streams, by gravity; also pumping. PUMPS.—Cap., 1,300,000 galls.; 2—650,000 Worthington high press. comp. dup. Anthracite buckwheat coal; av. cost, $1.10 per short ton. RESERVOIRS.—Cap., 430,000,000 galls.; two storage, 300,000,000 and 125,000,000; one distributing, 5,000,000. TANK.—Press rept., Dec. 30, '96, stated Co. was building a 44 × 30-ft. tank. DISTRIBUTION.—Mains, 45 miles. Taps made by Co. for $3. Services, lead and iron; paid for by consumer. Meters: 90; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for hotels, restaurants, liveries and large steam users. Hydrants, 121. PRESSURE.—Ordinary, 145 lbs. Steam fire engines are used. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $57,000, at 4%. MANAGEMENT.—D. W. Bland. Rept. by Genl. Mgr., Wm. D. Pollard, Aug. 21, '96. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 8, '83.

299. **PROSPECT PARK** (P. O. Moores), Delaware Co. See Swarthmore.

254. **PUNXSUTAWNEY,** Jefferson Co. (2,792.) Built in '87 by Punxsutawney Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. City to pay $25 per hydrant per yr. SUPPLY.—Driven wells, pumping to tank. PUMPS.—(In '89.) Cap., 1,000,000 galls.: 250,000 Epping direct-acting; 750,000 Gordon dup. TANKS.—Cap., 78,000 galls. DISTRIBUTION.—(In '90.) Mains, 4 miles. Taps, 175. Services, lead. Meters: 2. Hydrants, 20. CONSUMPTION.—(Galls.) av., 225,000. FINANCIAL.—Cap. Stock, $30,000. Debt, $25,000. Expenses: Operating, $2,792. Revenue, $4,525; Consumers, $4,000; City, fire protection, $525. MANAGEMENT.—Prest., J. A. Weber; Secy., G. W. Downes; Treas., T. E. Jones; Supt., C. E. Ratz. Rept. by Secy. in '96.

255. **QUAKERTOWN,** Bucks Co. (2,169.) Built in '96 by Quakertown Water Co.; put in operation Jan. 1. Engr., Jos. H. Young. Contr., C. J. Young, both of Philadelphia. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city every 20 yrs., price to be fixed by appraisement. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay $13.50 per hydrant per yr. No legal difficulties. SUPPLY.—Filter gallery near Tohickon Creek, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; Miller. Anthracite pea coal used; av. cost, $3.25 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; distributing; circular; 2 miles from town. DISTRIBUTION.—Mains, 7½ miles. Taps, 75; made by owner for $5. Services, lead and iron; paid for by owner. Meters: 5; owned, controlled and repaired by Co.; yearly rental, $1.00. Use of meters optional with consumer. Hydrants, 48. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock: Authorized, $30,000; all paid-up. Bonded debt, $30,000, at 5%. Expenses, int., $1,500. Revenue: City, fire protection, $648. MANAGEMENT.—Prest., C. T. Leland; Secy., A. H. Steinbrecker, both of Philadelphia; Supt., H. Louck. Rept. by C. J. Young, 806 Walnut St., Philadelphia, June 25, '96. SEWERS.—Has sanitary sewers.

D 20½. **QUARRYVILLE,** Lancaster Co. (346.) Built in '94 by Quarryville Water Co.; put in operation in Sept. Engr., A. A. Hyer, Lancaster. Contr., E. B. Kay, Bellwood. Co. is exempt from local taxes. No legal difficulties. Supply, springs, by gravity. RESERVOIR.—Cap., 400,000 galls. Mains, 2½ miles; cost extensions met by income. Taps, 110; made by Co. Services, iron. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, 1. Consumption (Galls.), av., 30,000. Pressure, 35 lbs. Cost, $7,000. Cap. Stock: Authorized, $10,000; all paid-up. Expenses: Operating, $50. Prest., W. M. Hensel; Secy. and Supt., L. T. Hensel; Treas., A. S. Harkness. Rept. by Supt., June 25, '96. Has sanitary sewers.

25. **RADNOR,** Delaware Co. (Township, 3,799.) See Berwyn.

257. **RANKIN,** Allegheny Co. (285.) Built in '94 by borough; put in operation Dec. 17. Engrs., Trimble & Miller, Pittsburg. Contr., J. P. McIntyre, McKeesport. SUPPLY.—Pennsylvania Water Co., Wilkinsburg, by meter. DISTRIBUTION.—Services, lead. PRESSURE.—Ordinary, 85 to 100 lbs. MANAGEMENT.—Supt., Thos. J. McBride.

258. **READING,** Berks Co. (58,661.) Bought by city in '65. Built in '19-21 by Reading City Water Co. SUPPLY.—Mountain streams, by gravity and pumping from Maiden Creek. PUMPS.—Cap., 15,000,000 galls.; Worthington: 1—5,000,000 comp. cond. and 1—10,000,000 comp. high duty. Anthracite pea coal used; av. cost, $2.20 per short ton. RESERVOIRS.—Cap., 181,600,000 galls. Storage: Antietam, 101,000,000; Bernhardt, 41,500,000; Egelman, 2,500,000. Distributing: Hampden, 30,000,000; Penn St., 5,150,000; Buttonwood St., 1,500,000. FISCAL YEAR CLOSED Apr. 6, '96. DISTRIBUTION.—Mains, 70 miles; cost extensions met by frontage tax. Taps, 16,000; made by city for $2 and $3. Services, lead and iron; paid for by owner. Meters: 167; owned, controlled and repaired by city. Use of meters optional with city; compulsory for factories, stables, saloons. Hydrants, public, 600; private, 15. CONSUMPTION.—(Galls.) av., 6,500,000. PRESSURE.—Ordinary, 30 to 120 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,600,000. Bonded debt: $125,000, at 4%, due in 1919; $200,000, at 4%, due 1920; $57,500, at 4%, due 1900; $75,000, at 4%, due 1902; $75,000, at 4%, due 1912. Sinking Fund, $30,210: $19,000 invested in bonds and $11,210 in cash. Expenses, $72,136: Operating, $45,000; int., $24,980; taxes, $2,156. Revenue, $125,162: Consumers, unmetered, $110,669; metered, $14,493. MANAGEMENT.—Prest., Geo. H. Felix; Secy., E. L. Lindermuth; Treas., H. G. Young; Supt., E. L. Nuebling; Ch. Pump. Engr., Wm. H. Ketchley. Rept. by Jas. Hangen, City Clerk, June 25, '96. PROJECTED IMPROVEMENTS.—Five miles of pumping main. SEWERS.—Has partial system of sanitary and storm sewers.

D 21. **REBERSBURG,** Center Co. (467.) Built in '96 by Rebersburg Water Co. for domestic use. No Engr. nor Contr. Supply, stream, by gravity. Cost, $4,000 (?). Cap. stock, $2,500. Treas., J. R. Brungart. Rept. by T. R. Zeigler, Jan. 21, '97.

259. **RED LION,** York Co. (524.) Built in '93 by Red Lion Water Co. SUPPLY.—Springs, pumping direct. PUMP.—Gardner steam. Bituminous coal used; av. cost, $2.95 per short ton. DISTRIBUTION.—Mains, 1.3 miles; cost extensions met by revenue. Taps, 97; made by Co. Services, lead and iron; paid for by consumer. Meters, 0. Hydrants, 11. PRESSURE.—Ordinary, 65 lbs. Steam fire engines are used. FINANCIAL.—Cost, $8,000. Cap. Stock: Authorized, $10,000; paid-up, $5,400; paid 5% div'd in '96. Bonded debt, $1,500, at 5%. Expenses, $353: Operating, $250; int., $75; taxes, $28. Revenue: City, none. MANAGEMENT.—Prest., N. Neiman; Secy., H. E. Craley; Treas., J. W. Zarfos; Supt., Wm. Lichtenberger; Ch. Pump. Engr., R. A. Lentz. Rept. by Supt., Dec. 22, '96. PROJECTED IMPROVEMENTS.—A 315,000-gall. reservoir. SEWERS.—None.

337. **RENDHAM,** Lackawanna Co. (Not given.) See Spring Brook Water Supply Co., Wilkes-Barre.

260. **RENOVO,** Clinton Co. (4,154.) Built in '72-3 by city. SUPPLY.—Peter's Run, by gravity, with pumping as auxiliary. RESERVOIR.—Cap., 2,000,000; on stream, ¾ miles from and 150 ft. above city. Rept. in '91 that new reservoir was to be built and connected with old by 1,000 ft. 8-in. c. i. pipe. Press rept., Dec., '93, stated dam about done. DISTRIBUTION.—Mains, 5 miles. Taps, 475. Services, w. i. Meters, 0. Hydrants, 62. FINANCIAL.—Cost, $57,000. Debt, $45,350, at 4 and 4½%. Expenses: Operating, $450. MANAGEMENT.—Chn. Water Comrs., M. Cleary. Rept. by Geo. O. Miller, Burgess. REFERENCE.—Eng. News, Nov. 11, '82.

261. **REYNOLDSVILLE,** Jefferson Co. (2,789.) Built in '88 by Reynoldsville Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates, not subject to regulation by city. SUPPLY.—Mountain spring, pumping to tanks. PUMPS.—Laidlaw-Dunn-Gordon, cap., 1,000,000 galls. each. Bituminous coal used; av. cost, 65 cents per short ton. TANKS.—Cap., 500,000 galls. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by income. Taps, 300; made by Co. for $1.75. Services, lead; paid for by consumer. Meters: 14; owned, controlled and repaired by Co. Use of meters compulsory for hotels and liveries. Co. cannot compel, but may prohibit use of meters. Hydrants, public, 23; private, 4. CONSUMPTION.—(Galls) av., 110,000. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $12,000; all paid-up. Bonded debt, $5,100, at 5%. Expenses, $1,740: Operating, $1,400; int., $255; taxes, $85. Revenue, $4,900: Consumers, unmetered, $3,100; metered, $900; City, fire protection, $550; street sprinkling, $100; public buildings, $50; other purposes, $200. MANAGEMENT.—Prest., Geo. Millinger; Secy., M. M. Davis; Treas., A. Reynolds; Supt., M. S. Sterley. Rept. by Supt., June 10, '96. SEWERS.—None.

262. **REYNOLDTON,** Allegheny Co. (1,379.) Built in '89 by borough. SUPPLY.—McKeesport works. After July 1, '97, water will be supplied from Elizabeth Water Co. (see Elizabeth) through meter. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Services, lead; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, 24. CONSUMPTION.—(Galls.) av., 55,000. PRESSURE.—Ordinary, 115 lbs. FINANCIAL.—Cost, about, $10,000. Bonded debt, $9,500, at 4½%; due in 1910. MANAGEMENT.—Secy. of Elizabeth Water Co., John McIntyre; Borough Clerk and Supt., D. R. Campbell. Rept. by Supt., July 14; Secy., Dec. 10, '96. SEWERS.—Has sanitary and storm sewers.

D 22. **RICHLAND** (P. O. Dean), Cambria Co. (Not given.) Built prior to '92 by Richland Water Co. for domestic use. Rept. in June, '96.

263. **RIDGWAY,** Elk Co. (1,903.) Built in '88 by city. SUPPLY.—Mountain streams, by gravity from reservoir. DISTRIBUTION.—Mains, 5 miles. Taps, 125. Hydrants, 30. FINANCIAL.—(In '88.) Cost, $23,879. Bonded debt, $23,879, at 4%. NOTE.—No rept. since '90-1 Manual.

299. **RIDLEY PARK,** Delaware Co. (512.) Formerly supplied by Ridley Park Cold Spring Water Co. See Swarthmore.

264. **ROARING SPRING,** Blair Co. (920.) Built in '93 by borough; put in operation Apr. 1. Engr., S. A. Hamilton. Contr., H. P. Malone, Hollidaysburg. SUPPLY.—Hoover's Run and springs. RESERVOIRS.—Cap., 84,000 galls.; two. TANK.—Cap., 40,000 galls. FISCAL YEAR CLOSED March 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income. Taps, 215; made by borough for $1.50. Services, paid for by owner. Meters, 0. Hydrants, public, 18; private, 10. CONSUMPTION. — (Galls.) av., 45,000. PRESSURE.—Ordinary, 180 lbs.; FINANCIAL.—Cost, $14,720. Bonded debt, $10,000 at 5%; due 1903; $3,000 at 5%, due 1906. Expenses: Operating, $65. Revenue: Consumers, $1,371; City, fire protection, $125. MANAGEMENT.—Chn., H. G. Hair; Secy., S. A. Hamilton; Treas., E. Hair; Supt., D. B. Carpenter. Rept. by Secy., June 25, '96. SEWERS.—None.

265. **ROBESONIA,** Berks Co. (714.) Owned by Robesonia Iron Co.; built about '60 (?). Furnishes general supply. SUPPLY.—Springs, by gravity.

266. **ROCHESTER,** Beaver Co. (3,649.) Now operated by Union Water Co., Beaver Falls, which see. Built in '90-1 by Valley Water Co. Borough voted $60,000 bonds for works in '95 and let contracts soon after. Work was arrested by action brought in court and in Sept., '96, Master appointed by State Supreme Court decided city had no right to establish competing plant.

37. **ROSEMONT,** Montgomery Co. See Bryn Mawr.

D 23. **ROUSEVILLE,** Venango Co. (728.) Domestic supply by Co. since '92.

D 24. **ROWENNA,** Lancaster Co. (Not given.) Built in '93 by Rowenna Water Co. for domestic supply. Supply, well, pumping to reservoir. Cost, $1,850.

267. **ROYERSFORD AND SPRING CITY,** Montgomery and Chester Cos. (Royersford, 1,815; Spring City, 1,797.) Built in '89-90 by Home Water Co.; rebuilt in '93. SUPPLY.—Schuylkill River, pumping to stand-pipe; filtered. PUMP.—Cap., 1,600,000 galls.: 2—800,000 Worthington; one comp. cond., one high pressure. Anthracite coal used; av. cost, $2.14 per short ton. FILTERS.—Cap., 1,000,000 galls.; Jewell. STAND-PIPE.—Cap., 188,000 galls.; 20 × 80 ft.; top 217 ft. above pump-room floor. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 18 miles; cost extensions met by income. Taps, 396; made by Co. Services, lead; paid for by consumer. Meters: 47; owned and controlled by Co.; repairs paid by consumer. Use of meters optional only with Co.; compulsory for factories. Hydrants, public, 34; private, 9. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary and fire, 85 lbs. Steam fire engines are used. FINANCIAL.—Cost, $89,216. Cap. Stock: Authorized, $60,000; all paid-up. Bonded debt, $29,200, at 4½%; due 1903. Expenses, $7,905: Operating, $2,887; int., $1,314; taxes, $568. Revenue, $4,769: Consumers, metered and unmetered, $6,961; City, fire protection, $856; other purposes, $88. MANAGEMENT.—Prest., J. A. Buckwalter; Vice-Prest., Milton Latshaw; Secy., U. S. G. Finkbiner; Treas., S. B. Latshaw; Supt., Jno. M. Shade. Rept. by Supt., Aug. 14, '96. SEWERS.—None. REFERENCE.—Jewell filters, Eng. News, May 28, '96.

299. **RUTLEDGE,** Delaware Co. (269.) See Swarthmore.

253. **SAINT CLAIR,** Schuylkill Co. (3,680.) Supply from Pottsville.

25. **SAINT DAVIDS,** Delaware Co. See Berwyn.

268. **SAINT MARYS,** Elk Co. (1,745.) Built in '89 by St. Mary's Water Co. SUPPLY.—Silver Creek, pumping to reservoir. PUMPS.—Cap., 300,000 galls.; from Young & Sacke, Titusville. RESERVOIR.—Cap., 150,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 6.5 miles. Taps, 150. Meters, 0. Hydrants, 40. CONSUMPTION.—(Galls.) av., 20,000. FINANCIAL.—Cost, $25,000. Cap. Stock: Authorized, $40,000; paid-up, $25,000. No debt. Expenses, $690: Operating, $600; taxes, $90. Revenue, $2,400: Consumers, $1,400; City, fire protection, $1,000. NOTE.—No rept. since '90-1 Manual.

269. **SAINT PETERSBURG,** Clarion Co. (655.) Built in '75 by borough. SUPPLY.—Spring, by gravity, and well. TANKS.—Cap., 140,000 galls. 2—50,000; one 40,000. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 3 miles. Taps, 150. Hydrants, 2-4in., 12. CONSUMPTION.—(Galls.) av., 12,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, about, $10,000. No debt. Expenses: Operating, $498. Revenue: Consumers, $688; City, none. NOTE.—No rept. since '90-1 Manual.

270. **SALTSBURG,** Indiana Co. (1,088.) Built in '94 by borough; put in operation Sept. 1. Engr., Robt. H. Wilson, Saltsburg. Contrs., Kay & Coon, Bellwood and Kingston. SUPPLY.—Conemaugh River, pumping to reservoir. PUMPS.—Cap., 750,000 galls.; Gordon dup. Pittsburg bituminous coal used; av. cost, $1.47 per short ton, delivered. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 3 miles. Taps, 90; made by borough, including service to curb. Services, galv. 1.; paid for by consumer from curb. Meters: 12; owned, controlled and repaired by borough. Borough can compel use of meters and

any consumer may have one. Hydrants, 20. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary, 60 to 120 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $12,000, at 5%. Expenses: Operating, $600. Revenue: Consumers, $850. MANAGEMENT.—Com.; Treas., Geo. F. Guss. Rept. by Robt. H. Wilson, Nov. 17, '96. SEWERS.—None.

D 25. **SANDY LAKE,** Mercer Co. (721.) Built in '94 by Austin Potter. Franchise, perpetual. Rates not subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. Supply, springs, by gravity. Fiscal year closed May 1, '96. Mains, 5 miles; cost extensions met by income. Taps, 80; made by Co.; paid by consumer. Services, paid for by consumer. Meters, 0. Use of meters optional with owner. Hydrants, 1. Pressure, ordinary, 50 lbs.; fire, 86 lbs. Cost, $9,000. Expenses: Operating, $2. Rept. by owner, Aug. 10, '96. No sewers.

271. **SAYRE,** Bradford Co. (1,584.) Built in '84 by Sayre Land Co. and leased to Sayre Water Co. SUPPLY.—Susquehanna River, pumping to reservoir. In '89 system was connected with that of Waverly, N. Y., to give both towns an emergency supply. PUMPS.—Cap., 4,500,000 galls.; 1—1,500,000 comp. cond. and 1—3,000,000 six cylinder triple exp. Worthington. Anthracite buckwheat coal used; av. cost, $2.25 per short ton. RESERVOIR.—Cap., 3,000,000 galls.; 191 ft. above Sayre, 200 ft. above Athens, 222 ft. above low water in river. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 18 miles. Taps, made by Co. Services, galv. i.; paid for by consumer. Meters, 85; owned by Co.; yearly rental, $2. Use of meters compulsory for hotels, laundries, etc.; optional with consumer. Hydrants, public, 43; private, 9. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cap. Stock: Authorized, $5,000; all paid-up; paid no div'd in '95. MANAGEMENT.—Prest., Robt. Lockhart; Secy. and Treas., E. P. Wilbur; both of So. Bethlehem; Supt., A. B. Shearer. Rept. by W. T. Goodnow, Genl. Mgr., June 8, '96. SEWERS.—Has some sanitary sewers. REFERENCE.—Eng. News, Apr. 3, '86.

272. **SCHUYLKILL HAVEN,** Schuylkill Co. (3,088.) Built in '84-5 by Schuylkill Haven Gas & Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. City to pay $12 per hydrant per yr. SUPPLY.—Mountain springs, by gravity and pumping. PUMP.—Worthington. Anthracite buckwheat coal used; av. cost $1 per short ton. RESERVOIRS.—Cap., 8,500,000 galls.; one 8,000,000; one 500,000. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 500; made by Co. for $2.50 and $3. Services, galv. i.; paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, 30. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary and fire, 130 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock: Authorized, $10,000. Floating debt, $9,000; Bonded, $75,000, at 6%. Expenses, $7,500: Operating, $3,000; int., $4,500. Revenue, $10,360: Consumers, unmetered, $10,000; City, fire protection, $360. MANAGEMENT.—Prest., Joshua Cayto; Secy. and Treas., Geo. I. Moyer; Supt. and Ch. Pump. Engr., W. H. Mellon. Rept. by Supt., Aug. 8, '96. SEWERS.—None.

273. **SCOTTDALE,** Westmoreland Co. (2,693.) Built in '90 by Citizens' Water Co.; put in operation Jan. 1, '91. FRANCHISE.—25 yrs. Rates as fixed in franchise are to be the same as at Uniontown. City to pay $1,400 per yr. for first 35 hydrants, $30 for each additional. No legal difficulties. SUPPLY.—Mountain streams, by gravity. RESERVOIR.—Cap., 82,000,000 galls.; storage, 5½ miles from city. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 16 miles; cost extensions met by income. Taps, 598; made by Co. Services, lead; paid for by consumer. Meters: 15; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional only with Co.; compulsory for factories, hotels, liveries. Hydrants, public, 45; private, 1. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $274,818. Cap. Stock: Authorized, $100,000; all paid-up. Floating debt, $15,048, at 6%; Bonded debt, $150,000, at 6%; due 1910; $9,500, at 6%; due 1904. Expenses, $13,291: Operating, $2,865; int., $10,287; taxes, $139. Revenue, $15,383: Consumers, $13,803; City, fire protection, $1,580. MANAGEMENT.—Prest., W. W. Jamison; Sec., Treas. and Supt., S. F. Potter, both of Greensburg. Rept. by Secy., June 18, '96. SEWERS.—Has sanitary and storm sewers.

274, 275, 276, 337. **SCRANTON,** Lackawanna Co. (75,215.)

SCRANTON GAS & WATER CO.

Built in '57. SUPPLY.—Surface water, by gravity from impounding reservoir, with small reservoir and stand-pipe as equalizers of pressure (and by pumping?). PUMPS.—Cap., 12,000,000 galls.; two Worthington: 1—10,000,000 hor. comp. cond. and 1—2,000,000 comp. non-cond. (Rept. by makers.) FILTERS.—Sand and gravel. RESERVOIRS.—(In '89.) Storage: Old, cap., 80,000,000; 4½ miles from and 300 ft. above city; new, no data. Distributing: Cap., 1,000,000; 200 ft. above city. In '93, W. W. Scranton, Pres., rept. that a 1,450,000,000 reservoir was projected; area 180 acres. Oct., '95, press rept. stated contract had been let for Stafford Meadow Brook dam to flood 185 acres. DISTRIBUTION.—(In '81.) Mains, 29.3 miles. Taps, 1,047. Hydrants, 106. FINANCIAL.—(In '81.) Cost, gas and water-works, $680,000. Cap. Stock: Authorized, $680,000. No debt. Revenue: City, $3,000. MANAGEMENT.—(In '96.) Prest., W. W. Scranton; Secy.

and Treas., G. B. Hand. SEWERS.—Has sanitary and storm sewers. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 1, '82.

PROVIDENCE GAS & WATER CO.

Built in '67-8. No legal difficulties. SUPPLY.—Storage reservoirs on streams, by gravity. RESERVOIRS.—Cap., 827,800,000 galls.: Storage, 610,000,000 and 200,000,000; distributing, 10,000,000, 4,000,000 and 3,800,000. FILTERS.—Cap., 10,000,000 galls. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 50 miles. Taps, 2,810; made by Co. for $5. Services, lead and galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meter and any consumer may have one. Hydrants, public, 120; private, 15. CONSUMPTION.—(Galls.) av., 7,000,000; max., 9,000,000; min., 5,000,000. PRESSURE.—Ordinary, 25 to 125 lbs. FINANCIAL.—Cap. Stock: Authorized, $350,000. Expenses: Operating, $5,000. Revenue: City, fire protection, $1,000. MANAGEMENT.—Prest., W. R. Storrs; Secy. and Treas., H. F. Atherton; Supt., J. B. Fish. Rept. by Supt., July 9, '96.

PEOPLES WATER CO.

Supplies part of 20th Ward and Bellevue Heights; now controlled by Spring Brook Water Supply Co.; see Wilkes-Barre.

277. **SELINS GROVE,** Snyder Co. (1,315.) Built in 85-6 by Selin's Grove Water-Works Co. FRANCHISE.—Hydrant rental, $40 each for 25; $30 each for balance. LEGAL DIFFICULTIES.—Press rept. Apr., '92, gave legal decision in detail in which borough was enjoined from paying Co. over $680 per yr. after Feb. 1, '96. Judge also held that boro. owed Co. $1,351 back rental and that contract was valid and had not been annulled by furnishing impure water, as alleged. SUPPLY.—Penn's Creek, pumping to reservoir and direct. PUMP.—Cap., 1,000,000 galls.; Knowles comp. RESERVOIR.—Cap., 1,000,000 galls.; 110 ft. above highest part of town. DISTRIBUTION.—(In '88.) Mains, 5 miles. Hydrants, 30. CONSUMPTION.—(Galls.) av., 100,000. FINANCIAL.—(In '88.) Bonded debt, $25,000, at 5%. Expenses: Operating, $600. NOTE.—No rept. since '90-1 Manual.

278. **SELLERSVILLE,** Bucks Co. (794.) Built in '96 by borough; put in operation Mar. 23. Engr., W. F. Cressman, Sellersville. Contr., E. S. Whitney, Allentown. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 1,500,000 galls.; 180 ft. above town. FISCAL YEAR CLOSED Sept. 1, '96. DISTRIBUTION.—Mains, 5 miles. Taps, 50; made by borough. Services, lead; paid for by borough to curb. Meters, 0. Hydrants, 33. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $27,000. Bonded debt, $27,000, at 4%; due 1926. MANAGEMENT.—Rept. June 25, '96. SEWERS.—Has storm sewers only.

279. **SEWICKLEY,** Allegheny Co. (2,776.) Built in '70-1 by borough. SUPPLY.—Springs, by gravity to and from reservoir and Ohio River pumping. PUMPS.—Cap., 1,350,000 galls.; 1—1,000,000 Hall comp.; 1—350,000 Worthington high pressure. Natural gas used. RESERVOIR.—Cap., 4,000,000 galls.; storage, 1 mile from pumping station. FISCAL YEAR CLOSED Mar. 31, '96. DISTRIBUTION.—Mains, 23 miles; cost extensions met by income. Taps, 630; made by borough. Services, lead; paid for by owner. Hydrants, 43. CONSUMPTION.—(Galls.) av., 450,000; max., 550,000; min., 300,000. PRESSURE.—Ordinary, 65 lbs.; fire, 80 lbs. FINANCIAL.—Cost, about $100,000. Debt, $80,000: Floating, $5,000; Bonded, $75,000: $60,000, at 5%, due 1903; $15,000, at 4%, due 1905. Expenses: Operating, $5,335; int. $3,912. Revenue, $12,389: Consumers, $11,873; misc., $516. MANAGEMENT.—Prest., E. B. Taylor; Secy., Hon. Geo. H. Anderson; Treas., First Nat. Bank, Allegheny; Supt., H. M. Van Cleve. Rept. by Supt., Aug. 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, July 15, '82; description of wells and pumps, Aug. 3, '89.

280. **SHAMOKIN,** Northumberland Co. (14,403.) Now owned by Roaring Creek Water Co., which built works to supply old Co. in '86. In '88 Anthracite Water Co. built works. Built in '73-4 by Shamokin Water Co. Also supplies Coal Township under name of Coal Water Co. The various Cos. named appear to have been practically all in same interest. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. No legal difficulties. SUPPLY.—Mountain streams and springs, by gravity and pumping in dry season. PUMPS.—Cap., 4,700,000 (?) galls.; Worthington: 2—1,400,000 comp. cond. high duty; 1—1,250,000 comp. non-cond. and 1—650,000 high pressure; all Worthington. Rept. by makers; rept. from Co. says: "Two auxiliary Worthington, used only during part of dry season." Coal used; av. cost, $1.50 per short ton. RESERVOIRS.—Cap., 45,000,000 galls.; five reservoirs. New reservoir (under construction), 350,000,000. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Taps, made by Co. Services, iron; paid for by consumer. Meters: 26; owned, controlled and repaired by Co. Use of meters compulsory for hotels. Co. can compel use of meters and any consumer may have one. Hydrants, public, 58; private, 7. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $600,000. Bonded debt, $200,000, at 5%; due 1916 and 1925. Revenue: City, fire protection, free. MANAGEMENT.—Prest., W. C. McConnell; Secy., Geo. O. Martz; Treas., C. Q. Williams. Rept. by Treas., June 16, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 15, '85.

281. **SHARON,** Mercer Co. (7,459.) Built in '85 by Sharon Water-Works Co. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Shenango River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; two Deane comp. cond. Gas used; av. cost,

10 cts. per 1,000 ft. RESERVOIR.—Cap., 1,500,000 galls.; distributing. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 20 miles; cost extensions met by income. Taps, 1,000; made by Co. for $8. Services, iron; paid for by consumer. Meters: 36; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 110; private, 3. CONSUMPTION.—(Galls.) av., 800,000; max., 1,000,000; min., 525,000. PRESSURE.—Ordinary and fire, 130 lbs. FINANCIAL.—Cost, $330,000. Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $100,000, at 6%. Expenses, $15,200: Operating, $8,000; int., $6,800; taxes, $400. MANAGEMENT.—Prest., H. S. Hopper; Secy., Jno. C. Owlsey; Treas., Walter Wood; Supt., E. J. Robinson. Rept. in '96 by R. D. Wood & Co., Philadelphia. SEWERS.—Has sanitary sewers.

299. **SHARON HILL,** Delaware Co. (429.) See Swarthmore.

282. **SHARPSBURG,** Allegheny Co. (4,898.) Built in '86 by borough. SUPPLY.—Allegheny River, pumping. PUMP.—Cap., 4,000,000 galls.; Gordon & Maxwell. Natural gas used; av. cost, 8 cents per 1,000 ft. FILTER CRIB.—In bed of river. Press rept., Aug., '93, stated crib 14 × 100 ft., 10 ft. deep was to be built. FISCAL YEAR CLOSED Nov. 31. DISTRIBUTION.—Mains, 5 miles; cost extensions met by income. Taps, made by city. Services paid for by consumer. Meters: None. Any consumer may have a meter. Hydrants, 51. PRESSURE.—Ordinary, 80 lbs.; fire, 125 lbs. FINANCIAL.—(In '88.) Cost, $54,000. Bonded debt, $50,000, at 5%. Expenses: Operating, $3,400; int., $2,500. Revenue, $6,500. MANAGEMENT.—Prest., Geo. D. McMoran; Secy., Chas. Clouse; Treas., H. S. Ayers; Supt., J. P. Altman. Rept. by Supt., July 13, '96. SEWERS.—Has some sanitary sewers.

P 25. **SHARPSVILLE,** Mercer Co. (2,330.) Borough is having well drilled and hopes to build in '97. Engr., J. B. Strawn, Salem, O. Supply, deep wells, pumping to standpipe. About 6½ miles of mains. Est. cost, $30,000. Rept. by Engr., late in '96.

283, 284. **SHENANDOAH,** Schuylkill Co. (15,944.)

CITIZENS' WATER & GAS CO.

Built in '70. FRANCHISE.—Perpetual, from '70. Does not provide for purchase of works nor regulation of rates by city. Co. is exempt from local taxes. City to pay $500 per yr. for fire protection. LEGAL DIFFICULTIES.—Suits for hydrant rental; verdict in favor of Co. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.—Cap., 100,000,000 galls.; three impounding and four distributing reservoirs. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by income. Taps, made by Co. for $4. Services, lead and iron; paid for by consumer. Meters: 6; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for breweries and collieries. Co. can compel use of meter and any consumer may have one. Hydrants, public, 25; private, 1. PRESSURE.—Ordinary, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $210,000. Cap. Stock: Authorized, $50,000; all paid-up. Expenses: Operating, $5,000; taxes, $500. Revenue: City, fire protection, $500; street sprinkling, $100. MANAGEMENT.—Prest., T. R. Beddall; Secy., F. C. Reese; Treas., Jno. A. Grant; Supt., E. J. Wasley. Rept. by Supt., Aug. 11, '96. SEWERS.—Has private sanitary sewers.

BOROUGH PLANT.

Built in '95; put in operation Aug. 1. Engr., A. J. Womersdorf, Pottsville. Contrs., Quinn & Kearns, Pottsville. LEGAL DIFFICULTIES.—Litigation as to the right of the borough to build works, brought by Citizens' Water & Gas Co., was settled by court in favor of the borough. SUPPLY.—Two streams, pumping to reservoirs. Water is pumped over a mountain through a 12-in. steel screw-jointed pipe 12,000 ft. long, with 884 ft. rise. PUMPS.—Cap., 2,500,000 galls.; two—1,250,000 comp. cond. Anthracite buckwheat coal used; av. cost, $1.68 per short ton, delivered. RESERVOIRS.—Cap., 12,000,000 galls.: 7,000,000 storage; 5,000,000 distributing. FISCAL YEAR CLOSED Aug. 1, '96. DISTRIBUTION.—Mains, 13 miles; cost extensions met by revenue. Taps, 1,000; made by borough for $3. Services, lead and iron; paid for by property owner. Meters: 20; owned, controlled and repaired by borough. Use of meters compulsory for breweries, laundries and collieries. Borough cannot compel but may prohibit use of meters. Hydrants, 60. CONSUMPTION.—(Galls.) av., 1,250,000. PRESSURE.—Ordinary, 98 lbs.; for fire can increase pressure to 135 lbs. in 10 minutes by the use of a regulator. FINANCIAL.—Cost, $160,000. Bonded debt, $145,000. Expenses: Operating, $9,000. Revenue: City, fire protection and street sprinkling, free. Deficits are met by a tax levy of five mills on all taxable property. MANAGEMENT.—Borough Council. Rept. by Supt., O. Betteridge, Dec. 7, '96.

247. **SHERIDAN,** Lebanon Co. (368.) Supply from Monongahela Water Co. See Pittsburg.

D 26. **SHICKSHINNY,** Luzerne Co. (1,448.) Built in '84 by Shickshinny Water Co. No legal difficulties. Supply, West Shickshinny Creek, fed by springs, by gravity. Fiscal year closed Nov. 1, '95. Mains, 2 miles; cost extensions met by income. Taps, 150; made by Co.; paid by consumer. Services, galv. i.; paid for by consumer. Use of meters optional with consumer. Hydrants, not given. Consumption, unknown. Pressure, 45 lbs. Cost, $12,000. Cap. Stock: Authorized, $12,000; all paid-up; paid 10% div'd in '95. Expenses: Operating, $150. Revenue: Consumers, $1,400. Prest., G. W. Search; Secy. and Supt., M. B. Hughes; Treas., J. Beadle. Rept. by Secy., July 12, '96. Has storm sewers only.

285. **SHIPPENSBURGH,** Cumberland Co. (2,188.) Built in '86 by borough. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.—Cap., 900,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Taps, 475; made by Co. Services, galv. i. Meters, 1. Hydrants, 45. CONSUMPTION.—(Galls.) max., 200,000; min., 175,000. PRESSURE.—Ordinary, 65 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $25,000, at 4%. Expenses: Operating, $200. MANAGEMENT.—Council; Supt., B. F. Landis. Rept. by Supt., in '96. SEWERS.—None.

D 27. **SHREWSBURY,** York Co. (562.) Built in '91 by Shrewsbury Water Co. Supply, Well, pumping to tank. Cost, $2,000. Cap. Stock: Authorized, $2,500. No rept. since '90-1 Manual.

D 28. **SINKING SPRING,** Berks Co. (768.) Built in '95 by Sinking Spring Water Co.; put in operation in Nov. Engr., Wm. H. Dechant, Reading. Supply, mountain springs, by gravity. Reservoir, cap., 500,000 galls.; one mile from and 165 ft. above village. Mains, 3 miles. Taps, 55; made by Co. for $3.50. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, private, 5. Cap. Stock: Authorized, $10,000; all paid-up. Expenses: Operating, $25. Prest., W. W. Light; Secy. and Treas., S. B. Deppel; Supt., F. P. Drick. Rept. by Secy., Dec. 21, '96. SEWERS.—None.

286. **SLATINGTON,** Lehigh Co. (2,716.) Now owned by borough. Built in '61 by Slatington Water Co.; bought in '83 and extended by borough. SUPPLY.—Mountain springs, by gravity. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 6.5 miles; cost extensions met by revenue. Taps, 337. Meters, 1. Hydrants, 28. FINANCIAL.—Cost, $26,635. Expenses: Operating, $150; int., $1,065. Revenue, $2,381. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 18, '82.

287. **SMETHPORT,** McKean Co. (1,150.) Built in '81 by Smethport Water Co. FRANCHISE.—99 yrs. from '81. Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Spring brook, by gravity. RESERVOIRS.—Cap., est., 375,000 galls.; area, about ½ acre; av. depth, 5 ft. FISCAL YEAR CLOSED Sept. 30. DISTRIBUTION.—(In '90.) Mains, 6 miles. Taps, 200. Services, w. i. or lead. Meters 0. Hydrants (in '96), 30. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $28,500. Cap. Stock: Authorized, $30,000; paid-up, $28,500; paid 9% div'd in '95. No debt. MANAGEMENT.—Prest., H. Hamlin; Secy. and Treas., A. B. Armstrong. Rept. by Secy., June 30, '96.

288. **SOMERSET,** Somerset Co. (1,713.) Built in '94 by borough; put in operation Dec. 7. Contrs., Malone & Bro., Hollidaysburg. SUPPLY.—Two artesian wells, 130 ft. deep, pumping to reservoir. PUMPS.—Cap., 250,000 galls.; two Downie deep well. Bituminous coal used; av. cost, 94 cts. per short ton. RESERVOIRS.—Cap., 450,000 galls.; distributing, elev. 145 ft. above highest part of town. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.— Mains, 4.1 miles; cost extensions met by income. Taps, 107; made by borough for $5, including service to curb. Services, lead. Meters: 4; owned, controlled and repaired by borough; yearly rental, none. Borough can compel use of meter and any consumer may have one. Hydrants, 52. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $25,000, at 5.4%; due 1919. Expenses: Operating, $701. Revenue: Consumers, unmetered, $1,024; metered, $75. MANAGEMENT.—Burgess, Wm. H. Welfley. Rept. by Burgess, Aug. 10, '96. SEWERS.—None.

289. **SOUDERTON,** Montgomery Co. (679.) Built in '96 by borough; was to be finished by Oct. 1. Engr., Warren F. Cressman, Sellersville. Contr., Bolton G. Coon, Kingston. SUPPLY.—Springs, pumping from small receiving to distributing reservoir. PUMPS.—Cap., 300,000 galls.; Deming triplex, driven by 13-HP. Otto gas engine. RESERVOIRS.—Cap., about 500,000 galls. DISTRIBUTION.—Hydrants, 38. FINANCIAL.—Cost, est., $15,000. Rept. by Mich. Bergey, Jr., Boro. Clk., Sept. 8, '96. SEWERS.—Has sanitary and storm sewers.

290, D 29. **SOUTH BETHLEHEM,** Northampton Co. (10,302.)

SOUTH BETHLEHEM GAS & WATER CO.

Built in '75. Supplies West Bethlehem. SUPPLY.—Lehigh River, pumping to reservoir. PUMPS.—Cap., 7,000,000 galls.; 5,000,000 Gaskill hor. high duty; 2,000,000 Dickson. Anthracite pea coal used; av. cost, $1.96 per short ton. RESERVOIRS.—Cap., 15,000,000 galls.: 12,000,000 impounding; 2—1,500,000 distributing. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 9 miles. Taps, 1,400; made by Co. Services, galv. i; paid for by Co. to curb. Meters, 4. Consumer can have meter by special agreement. Hydrants, 98. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 65 to 108 lbs. No fire engines used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., W. A. Wilbur; Secy. and Treas., E. P. Wilbur, Jr.; Supt., C. H. Weisser. Rept. by Supt., Oct. '29, '96. SEWERS.—Has partial sanitary sewers. REFERENCE.—Eng. News, Apr. 22, '82.

MOUNTAIN WATER CO.

Built in '93 by Mountain Water Co. Expects to furnish fire protection later. Franchise, perpetual. Rates not subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. Supply, springs, by gravity and pumping from wells in dry season. Pumps, cap., 720,000 galls.; Bacon air lift. Anthracite buckwheat coal used; av. cost,

$2.25 per short ton. Reservoir, cap., 1,300,000 galls. Mains, 4 miles. Taps, 150; made by Co., free, including service to curb. Services, galv. 1. Meters: 2; owned and controlled by Co.; yearly rental, none. Use of meters optional with consumer; compulsory for public houses. Consumption (Galls.), av., 400,000. Pressure, ordinary, 100 lbs. Cost, $40,000. Cap. Stock: Authorized, $25,000; all paid-up. Bonded debt, $8,000, at 6%. Expenses, $780: Operating, $300; int., $480. Revenue: Consumers, unmetered, $1,600. Prest., C. A. Worsley; Secy., H. C. Cope; Supt., A. L. Cope. Rept. by Supt., Nov. 19, '96. Has partial sanitary sewers.

47. **SOUTH CHESTER** (P. O., Thurlow), Delaware Co. (7,076.) See Chester.

291. **SOUTH EASTON** (P. O. Easton), Northampton Co. (5,616.) Built in '86-8 by South Easton Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—From tunnel into mountain; by gravity, with pumping from Lehigh River as auxiliary. PUMPS.—Cap., 250,000 galls.; Worthington high pressure. Anthracite coal used; av. cost, $4.40 per short ton. RESERVOIRS. —Cap., 750,000 galls. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by income. Taps, 200; made by Co., free. Services, galv. 1.; paid for by consumer. Meters, 0. Co. cannot compel, but may prohibit use of meters. Hydrants, 23. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary and fire, 90 lbs. One steam fire engine is used. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $20,000; all paid-up. Pref'd, authorized, $5,000; paid-up, $3,100; 4% div'd guaranteed. Floating debt, $800, at 6½%; bonded, $10,000, at 5%. Expenses, $3,060: Operating, $2,000; int., $1,030; taxes, $30. Revenue: City, fire protection, $575; other purposes, $33. MANAGEMENT.—Prest., Wm. Coyle; Secy. and Treas., W. B. Solliday. Rept. by Secy., June 8, '96. SEWERS.—None.

292. **SOUTH FORK,** Cambria Co. (1,295.) Built in '92 by South Fork Water Co. for general supply. SUPPLY.—By gravity. FINANCIAL.—Cost, est., $15,000. Cap. Stock: Authorized, $15,000. MANAGEMENT.—(In '92.) Treas., E. S. Grumbling. Information from citizen in '96 and new incorp. returns.

—? **SPANGLER,** Cambria Co. (500.) Spangler Water Co. incorp. Aug. 24, '92, with authorized cap. stock of $2,000. Sept., '92, press rept. stated Co. had organized and would lay one mile 4-in. c. i. pipe at once. Another press rept. stated pump and boiler for works had arrived.

267. **SPRING CITY,** Chester Co. (1,797.) Supply from Royersford.

D 30. **SPRINGTOWN,** Bucks Co. (296.) Built in '96 by Springtown Water Co. for domestic supply. Supply, springs, by gravity. Cap. Stock, $1,400. Address Jacob B. Pearson. Rept. by A. W. Hess, Oct. 21, '96.

25. **STAFFORD** (No P. O.), Chester Co. See Berwyn.

293. **STATE COLLEGE,** Center Co. (336.) Built in '95 by State College Water Co. SUPPLY.—Roaring Branch, by gravity. RESERVOIR.—Cap., 400,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 100. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cap. Stock, $11,000. Bonded debt, $11,000, at 5%. MANAGEMENT.—Prest., Jno. W. Stuart; Secy. and Treas., Wm. Frear. Rept. by Secy., June 30, '96.

294. **STEELTON,** Dauphin Co. (9,250.) Built in '92 by Steelton Home Water Co.; put in operation Sept. 1. Engr., M. M. Dreibellis. Contr., Thos. E. Ahrens. FRANCHISE.—10 yrs. Rates are not fixed in franchise not subject to regulation by city. Co. is exempt from local taxes. City to pay $2,600 a yr. for public service. No legal difficulties. SUPPLY.—Susquehanna River, pumping to reservoir. PUMPS.—Cap., 2,300,000 galls.; Deane comp. dup. Bituminous coal used. FILTERS.—Natural. RESERVOIR.—Cap., 10,000,000 galls. DISTRIBUTION.—Mains, 11 miles; cost extensions met by rentals and tapping fees. Taps, 600; made by Co. for $2. Services, 3 ft. of lead, balance iron; paid for by property owner. Meters: 4; owned by consumer. Use of meters not optional with consumer; compulsory for manufacturing. Hydrants, 76. PRESSURE.—Ordinary and fire, 112 lbs. FINANCIAL.—Cost, $160,000. Cap. Stock: Authorized, $80,000. Bonded debt, $80,000, at 5%. Expenses: Operating, $2,500. MANAGEMENT.—Prest., P. D. Warner; Secy., R. B. Kinsey; Treas., H. E. Ahrens; Supt., Chas. Shutter. Repts. by Supt., Dec. 7, '96, and Secy., Jan. 18, '97. SEWERS.—Has partial sanitary sewers.

338. **STERRETT TOWNSHIP,** Allegheny Co. (1,182.) See Wilkinsburg.

295. **STROUDSBURG,** Monroe Co. (2,419.) Built in '76 by Stroudsburg Water Co. FRANCHISE.—City to pay $300 for fire protection. SUPPLY.—Springs by gravity and pumping. RESERVOIR.—Cap., 5,000,000 galls. Built in '92; Engr., H. R. Fehr, Scranton. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 10 miles. Hydrants, 30. FINANCIAL.—Cap. Stock, $25,000. Revenue: City, fire protection, $300. MANAGEMENT.—Prest., Jno. B. Storm; Secy., T. C. Brown; Treas. and Supt., A. N. Snover. REFERENCE.—Eng. News, May 6, '82.

337. **SUGAR NOTCH,** Luzerne Co. (2,586.) See Spring Brook Water Supply Co., Wilkes-Barre.

296. **SUMMIT HILL,** Carbon Co. (2,816.) Built in '76 by Summit Hill Water Co. SUPPLY.—Mountain stream, pumping to reservoir. PUMP.—Cap., 30,000 galls.; Carter & Allen dup. RESERVOIR.—Cap., 281,250 galls. DISTRIBUTION.—Mains, 5 miles; cost:

extensions met by income. Taps, 800. Hydrants, 10. FINANCIAL.—Cost, about, $14,000. Cap. Stock, $10,100. Paid 6% div'd in '95. No debt. Expenses: Operating, $1,439; state tax, $76. Revenue: Consumers, $2,916. MANAGEMENT.—Rept. by Treas., Jas. McCready, Oct. 10, '96.

297. **SUNBURY,** Northumberland Co. (5,930.) Built in '83-4 by Sunbury Water Co. SUPPLY.—Surface and spring water, pumping from impounding to distributing reservoir. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington high pressure. RESERVOIRS.—Cap., 4,700,000 galls.: Impounding, 700,000; distributing, 4,000,000, one mile from and 131 ft. above town. DISTRIBUTION.—(In '88.) Mains, 11 miles. Taps, 450. Meters, 2. Hydrants, 40. CONSUMPTION.—(Galls.) av., 750,000. FINANCIAL.—(In '88.) Cost, $110,000. Cap. Stock, $33,000. Debt, at 6%. Revenue: Consumers, $9,000; City, $1,200. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Sept. 5, '85.

298. **SUSQUEHANNA,** Susquehanna Co. (3,872.) Built in '74 by Susquehanna Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs, by gravity. RESERVOIRS.—Four, cap., 44,942,000 galls.: Storage, 44,880,000; distributing, 32,000; 16,000 and 14,000. FISCAL YEAR CLOSED Oct. 15, '95. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by stock. Taps, 160; made by Co. Services, galv. i.; paid for by consumer. Meters: 14; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for hotels, saloons, stables. Hydrants, 7. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $32,000. Cap. Stock: Authorized, $32,000; all paid-up. Expenses: Operating, $327. Revenue, $2,200. MANAGEMENT.—Prest., M. H. Elsman; Treas., C. F. Curtis; Supt., V. Blackburn. SEWERS.—None. REFERENCE.—Eng. News, Oct. 29, '81.

299. **SWARTHMORE.** Delaware Co. (218.) Built in '89 by Springfield Water Co. Reconstructed in '92. Supplies the following places: Darby, Sharon Hill, Glenolden, Norwood, Prospect Park, Ridley Park, Moores, Crumlynne, Boone, Collingdale, Oakeola, Llanwellyn, Holmes, Folsom, Milmont, Fairview, Fernwood, Landsdowne, Burmont, Clifton, Adamsford, Primos, Secane, Morton, Swarthmore, Llanerch, Rutledge, Kellyville, Colwyn. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia, Pa. SUPPLY.—Crum Creek, pumping to reservoir. PUMPS.—Cap., not given; Corliss engine and six Gould's water power and steam triplex pumps. Anthracite buckwheat coal used. FILTERS.—Roske. RESERVOIR.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 80 miles. Taps, 2,000; made by Co. for $3.50. Services, lead and iron; paid for by consumer. Meters, 30; owned, controlled and repaired by Co.; yearly rental, 10% of cost. Use of meters optional with Co.; compulsory for factories, greenhouses, &c. Hydrants, public, 78; private, 7. CONSUMPTION.—(Galls.) av., 600,000; max., 1,000,000; min., 400,000. PRESSURE.—Ordinary, 60 to 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jas. W. Hanly, Media; Secy., H. B. Hodge, Philadelphia; Treas., N. B. Cox; Supt., Wm. E. Rowland; Ch. Pump. Engr., R. P. Northrup. Rept. by Am. Pipe Mfg. Co., Philadelphia, June 8, '96.

300. **TACONY** (P. O., Philadelphia), Philadelphia Co. (Suburb of Philadelphia; pop. included in city.) Built in '78-9 by Disston Water Co. in connection with factory and real estate interests of Henry Disston & Sons. FRANCHISE.—Provides for purchase of works by city at any time, price to be fixed by three arbitrators. Rates not subject to regulation by city. No hydrant rental. SUPPLY.—Delaware River, pumping direct and to tanks. PUMP.—Cap., 1,000,000 galls.; Worthington. TANKS.—Two, cap., 280,000 galls.; 225,000 and 55,000. FISCAL YEAR CLOSED Sept. 30. DISTRIBUTION.—Mains, 10½ miles. Taps, 925. Meters, 0. Hydrants, 83. FINANCIAL.—No debt. MANAGEMENT.—Prest., Wm. Disston; Secy., Wm. Miller; Treas., J. S. Disston; Supt., Wm. Smith. Rept. by Secy., Sept. 30, '96.

301. **TAMAUQUA,** Schuylkill Co. (6,054.) Built in '51 by borough. SUPPLY.—Rabbit Run and Owl Creek, by gravity from impounding reservoir. RESERVOIRS.—Cap., 57,000,000 galls. Rabbit Run, cap. 20,000,000; Owl Creek, cap., 37,000,000. DISTRIBUTION.—Mains, 10 miles. Taps (probably faucets), 1,450. Meters, 0. Hydrants, 97. FINANCIAL.—Cost, (in '88) $58,000. Bonded debt, $43,000; $20,000 at 4½%, due 1905. Expenses, $2,751: Operating, $920; int., $1,831. Revenue, $7,154. MANAGEMENT.—Council; Supt., J. L. Mackey. NOTE.—No rept. since '90-1 Manual.

302. **TARENTUM,** Allegheny Co. (4,627.) Owned by Tarentum Water Co. Built in '86 by H. M. Brackenridge; bought by Co. in '88. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs, pumping to reservoir. PUMPS.—Cap., 500,000 galls. RESERVOIR.—Cap., 500,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 14 miles. Taps, 720; made by Co. free. Services, galv. i.; paid for by consumer. Meters, 7; owned, controlled and repaired by Co. Use of meters compulsory for factories. Hydrants, 38. CONSUMPTION.—(Galls.) av., 225,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $67,511. Cap. Stock: Authorized, $50,000; all paid-up. Bonded debt, $25,000 at 6%. Expenses, $5,870: Operating, $4,370; int., $1,500. MANAGEMENT.—Prest., H. M. Brackenridge; Secy. and Treas., J. W. Hemphill; Supt., F. W. McDowell; Ch. Pump. Engr., W. J. Staley. Rept. by Secy., June 23, '96. SEWERS.—None.

337. **TAYLOR,** Lackawanna Co. (Not given.) See Spring Brook Water Supply Co., Wilkes-Barre.

189. **TAYLORVILLE,** (P. O. Scranton) Lackawanna Co. (Not given.) Supply from Minooka.

303. **THOMPSON,** Susquehanna Co. (302.) Built in '91 by private Co.; put in operation Dec. 14. Engrs. and Contrs., Gaylord and Stephens, Binghamton, N. Y. FRANCHISE.—Perpetual. Rates are not fixed in franchise nor subject to regulation by city. Co. not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Springs, by gravity from two small collecting reservoirs. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by stock. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, 6. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $3,500. Floating debt, $700 at 5%. Expenses: Operating, $25. MANAGEMENT.—Prest., G. K. Lamont; Secy., B. F. Barnes; Treas. and Supt., W. W. Messenger. Rept. by F. W. Lewis, Aug. 7, '96. SEWERS.—None.

304. **TIDIOUTE,** Warren Co. (1,328.) Built in '71 by Tidioute Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Mountain stream, by gravity from impounding to distributing reservoir. RESERVOIRS.—Impounding, 4 miles from town. Distributing: Cap., 520,000 galls.; 160 ft. above town. DISTRIBUTION.—Mains, 11 miles. Taps, 167. Meters, 0. Hydrants, 27. FINANCIAL.—Cost (in '87), $40,000. Expenses: Operating, $700. Revenue: City, fire protection, $500. MANAGEMENT.—Prest. and Supt., T. W. Irwin; Secy., W. R. Dawson; Treas., H. H. Cummings. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Sept. 26, '85.

305. **TIOGA,** Tioga Co. (557.) Built in '74 by T. A. & C. H. Wickham. In '88 Tioga Water Co. was incorp, and assumed control of works. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Bentley Creek, by gravity from impounding to distributing reservoir, and pumping in case of drought. PUMPS.—Cap., 1,500,000 galls; Worthington. RESERVOIRS.—Cap., 15,000,000 galls. Impounding: 14,000,000; area, 1½ acres. Distributing, 1,000,000. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 3.2 miles. Taps, 85. Services, galv. i. Meters, 0. Hydrants, public, 14. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $15,000; all paid-up. No debt. Revenue: City, fire protection, $500. MANAGEMENT.—Prest., G. G. Saxton; Secy. and Supt., T. A. Wickham. Rept. by Secy., Sept. 28, '96. REFERENCE.—Eng. News, Oct. 15, '81.

306. **TIONESTA,** Forest Co. (677.) Built in '94 by Tionesta Water Co.; put in operation Nov. 1. Engr., F. F. Whittiken, Tionesta. Contr., A. L. Shellhammer, Warren. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay $218 per year. No legal difficulties. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 660,000 galls.; 120 ft. above town. FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 4 miles. Taps, 100. Services, galv. i. Meters, 0. Co. cannot compel and may prohibit use of meters. Hydrants, public, 15; private, 2. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $12,000. Cap. Stock: Authorized, $12,000; paid-up, $10,000. Floating debt, $1,200 at 6%. Expenses: Operating, $250; taxes, $100. Revenue: Consumers, $1,100; City, fire protection, $250; public buildings, $200. MANAGEMENT.—Prest., G. W. Robinson; Secy. and Treas., A. B. Kelly; Supt., A. W. Richards. Rept. by Co., July 9, '96. SEWERS.—Has sanitary sewers.

307. **TITUSVILLE,** Crawford Co. (8,073.) Built in '73 by city. SUPPLY.—Wells, pumping direct. In '89 there were two 15 × 22-ft. wells and a 10-in. well, 600 ft. deep, from which water flowed to others. PUMPS.—Cap., 2,000,000 galls.; Holloy quadruplex. FISCAL YEAR CLOSED Apr. 4, '96. DISTRIBUTION.—(In '87.) Mains, 11 miles. Taps, 850. Meters, 25. Hydrants, public, 66. CONSUMPTION.—(Galls.) av., 1,000,000. FINANCIAL.—Cost, $148,151. Bonded debt, $54,900, at 4%, due from '96 to 1909. Expenses: Operating, $7,493; int., $2,507. Revenue, $16,957. MANAGEMENT.—Mayor W. B. Benedict; City Controller, J. A. C. Dubar. NOTE.—Financial information and officials from annual rept. for '95-6; no written rept. received. SEWERS.—Has parital sanitary sewers. REFERENCE.—Eng. News, Mar. 11, '82.

308. **TOPTON,** Berks Co. (500.) Built in '93 by borough. Engrs., A. S. Heffner and M. H. Brendlinger. Contrs., J. W. Schrawder & Co. No legal difficulties. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 390,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 103; made by borough for $1. Services, galv. i.; paid for by borough to curb. Meters, 0. Hydrants, public, 21. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $12,000. Expenses, operating, $35. Deficits, met by one mill tax. MANAGEMENT.—Prest., Wm. J. Fritz; Secy. and Supt., M. H. Brendlinger; Treas., S. B. Smith. Rept. by Secy., Aug. 7, '96. SEWERS.—None.

309. **TOWANDA,** Bradford Co. (4,169.) Built in '79 by Towanda Water-Works Co. FRANCHISE.—Provides for purchase of works by city 5 yrs. from Oct. 1, '96. Rates are fixed in franchise. SUPPLY.—Surface water, by gravity and river by pumping. PUMP.—Cap., 1,000,000 galls.; Holly hor. dup. DISTRIBUTION.—Mains, 8 miles. Taps, 450. Meters, 0. Hydrants, public, 50. FINANCIAL.—Press rept., Aug., '96, stated works would change hands Sept. 1, new owners paying $75,000 and assuming bonded debt of $100,000. Revenue (in '90), $9,000: Consumers (in '87), $6,000; City, $3,000. MANAGEMENT.—(Press rept. of election under new control, Sept., '96): Prest., G. W. Kipp;

Secy., Jas. H. Codding; Treas. and Gen. Mgr., E. F. Kizer, Monroeton. NOTE.—No official rept. since '90-1 Manual.

310. **TREMONT,** Schuylkill Co. (2,064.) Built in '66; operated since '74 by Tremont Gas & Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Mountain stream and spring, by gravity; filtered supply increased threefold and pressure doubled in '90-1. RESERVOIRS.—Cap., not given; one of 1,000,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 2.9 miles. Taps, 116. Services, galv. i. and lead. Meters, 0. Hydrants, 6. CONSUMPTION.—(Galls.) av., 35,000. FINANCIAL.—Cost, $32,000. Cap. Stock: Authorized, $40,000; paid-up, $10,500; paid 5% dividends since '90. Pref'd, authorized, $9,000; paid-up, $8,000. Debt, $13,000: Floating, $250, at 5%; bonded, $13,000, at 5%, due 1905. Expenses, $1,164: Operating, $150; int., $1,064; taxes, $80. Revenue, $1,700: Consumers, $1,550; City, fire protection, $150. MANAGEMENT.—Prest., Z. Batdorff; Secy. and Supt., J. A. Bechtel; Treas., C. B. Sillyman.

311, 312. **TROY,** Bradford Co. (1,307.) Built in '80 by two private Cos. In '93 the borough acquired the plant of the Edgewood Water Co.

BOROUGH WORKS.

Built in '80 by Co. and bought by borough in '93, as above. LEGAL DIFFICULTIES.—Dec., '96, suit was pending between Co. and boro. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 73,500 galls.; two, 60,000 and 13,500. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by bonds. Taps, 160; made by borough, free. Services, galv. i.; paid for by owner. Meters, 0. Hydrants, public, 31. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 75 lbs. Steam fire engines are not used as a rule. FINANCIAL.—Cost, $19,426. Bonded debt, $13,050, at 4½%; $1,100, at 5%. Expenses, operating, $150. Deficits, $750, raised annually by taxation to pay debt. MANAGEMENT.—Prest., L. Bliss; Secy., H. K. Mitchell. Rept. by Secy., Aug. 10, '96. SEWERS.—Has partial sanitary sewers.

TROY WATER CO.

Built in '80. SUPPLY.—Springs, by gravity. DISTRIBUTION.—Mains, 2 miles. Taps, 200. Meters, 0. Hydrants, 8. FINANCIAL.—(In '88.) Cost, $4,000. NOTE.—No rept. since '90-1 Manual, but Co. was still operating works in '96.

313. **TUNKHANNOCK,** Wyoming Co. (1,253.) Built by two Cos. Slocum Springs Water Co.'s works built in '59; Tunkhannock Water Co.'s works built in '70. Latter Co. has since acquired the works of the Slocum Springs Water Co. SUPPLY.—Springs, by gravity, and Susquehanna River, by pumping. FILTER.—Cap., 100,000 galls.; Hyatt (or New York). PUMP.—Cap., 350,000 galls.; Worthington. DISTRIBUTION.—Mains, 7 miles. Taps, 438. FINANCIAL.—Cap. Stock, $40,000. Rept. by Borough Clerk, Jos. Wood, Sept. 28, '92. REFERENCE.—Eng. News, June 17, '82.

78. **TURTLE CREEK,** Allegheny Co. (1,114.) See East Pittsburg.

314. **TYRONE,** Blair Co. (4,705.) Built in '70 by Tyrone Gas & Water-Works Co. SUPPLY.—Sinking Spring Run, by gravity from impounding reservoir. RESERVOIR.—Cap., 25,000,000 galls.; area, 9 acres; 27 ft. deep. DISTRIBUTION.—Mains, 11 miles, 20 to 3-in. Taps, 650. Services, galv. and black i. Hydrants, 42. FINANCIAL.—Cost, $50,000. No debt. Expenses, operating, $600. MANAGEMENT.—Prest., C. Guyer; Secy. and Treas., C. A. Moris; Supt., C. H. Dieffenbaugh. Rept. by Supt., Oct. 1, '96. REFERENCE.—Eng. News, May 26, '83. NOTE.—Since above was put in type it has been learned that the Co. has absorbed the East Tyrone Water Co. See East Tyrone.

315. **ULYSSES,** Potter Co. (801.) Built in '85 by Lewisville Water Co. Remodelled in '95. FRANCHISE.—Co. is exempt from local taxes. No compensation for public service. No legal difficulties. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 160,000 galls. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by income. Taps, 125; made by Co., free. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 12,000. PRESSURE.—Ordinary, 40 to 60 lbs. FINANCIAL.—Cost, $8,000. Cap. Stock: Authorized, $8,000; all paid-up. Bonded debt, $3,000, at 6%. Expenses: Operating, none; taxes, $40. Revenue: City, fire protection, $120. MANAGEMENT.—Prest., W. J. Lewis; Secy., D. C. Chuse; Treas. and Supt., Geo. C. Marion. Rept. by Treas., June 6, '96. SEWERS.—None. REFERENCE.—Eng. News, Apr. 17, '86.

316. **UNION CITY,** Erie Co. (2,261.) First works built in '85 by Wm Dunmeyer; bought in '89 or '90 by boro., and were then used for fire protection only. In '92 boro. extended works for general supply. SUPPLY.—Springs, by gravity and pumping for fire protection. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Holly dup. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by income. Taps, 300; made by plumbers; no fee. Services, iron; paid for by owner. Meters, 0. Use of meters optional with borough. Hydrants, public, 43. PRESSURE.—Ordinary, 44 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $27,000. Bonded debt, $23,500, at 5%. Revenue, $3,100: Street sprinkling, $600; other purposes, $2,500. MANAGEMENT.—Prest., O. Glezen; Secy. and Supt., J. E. Gillett; Treas., L. Wilson; Ch. Pump. Engr., E. Warner. Rept. June 6, '96. SEWERS.—Has partial sanitary sewers.

317. **UNIONTOWN,** Fayette Co. (6,359.) Built in '83 by Uniontown Water Co. No legal difficulties. SUPPLY.—Springs, by gravity from impounding reservoir. RESERVOIRS.—Cap., 24,000,000 galls.: 2—3,000,000; 1—18,000,000. DISTRIBUTION.—Mains, 30 miles. Taps, made by consumer. Services, lead; paid for by consumer. Meters, 40; owned by Co. and consumer; controlled by Co.; yearly rental, 10% on cost of meter. Use of meters optional with consumer; compulsory for large users. Hydrants, public, 84. PRESSURE.—Ordinary, 160 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., W. H. Playford; Secy. and Treas., M. H. Bowman; Supt., G. H. Seaton. Rept. by Supt., Aug. 11, '96. SEWERS.—Has some sanitary sewers. REFERENCE.—Eng. News, Sept. 13, '84.

47. **UPLAND,** Delaware Co. (2,275.) Supply from Chester.

25. **UPTON,** Franklin Co. See Berwyn.

P 26. **VANDERGRIFT,** Westmoreland Co. (Not given.) Vandergrift Water Co. expects to finish works in '97. Engrs., Wilkins & Davison, Pittsburg. Contrs., Chandley Bros. & Co., Beaver Falls. Supply, wells and spring, pumping to tank. Rept. by W. H. Chandley, Oct. 8, '96. Besides above it appears that it was expected in May, '96, that Apollo Iron & Steel Co. would locate here. Press repts. state that contract was awarded in July, '96, and that Co. had bought right to use water from wells of Apollo Spring Water Co.

318. **VERONA AND OAKMONT,** Allegheny Co. (Verona, 1,477; Oakmont, 1,678.) Built in '94-5 by Suburban Water Co. of Allegheny Co.; put in operation in August. Des. Engrs., James H. Harlow & Co., Pittsburg; Constr. Engr., H. F. Labelle; Contrs., P. H. Harrison & Sons, New York and Newark, N. J. FRANCHISE.—Perpetual. Rates are fixed in franchise and subject to regulation by borough. Co is exempt from local taxes by general legislative enactment. Verona only pays for fire hydrants; $40 per yr. each. Contract for term of 10 yrs., beginning July 1, '94. No legal difficulties. SUPPLY.—Allegheny River, pumping to reservoir. PUMP.—Cap., 850,000 galls.; Wilson & Snyder comp. dup. Bituminous slack coal used; av. cost, $0.90 per short ton. FILTER CRIB.—Cap., 1,000,000 galls.; under river bed. RESERVOIR.—Cap., 1,600,000 galls.; distributing, located near Verona. Elev. 879 ft. above pump. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 10 miles. Taps, 350; made by consumer for $1. Services, lead; paid for by consumer. Meters: 21; owned and repaired by consumer; controlled by Co. Use of meters optional with consumer. Hydrants, public, 30 (in Verona); private, 3. CONSUMPTION.—(Galls.) av., 185,750. PRESSURE.—Ordinary and fire, 75 to 160 lbs. FINANCIAL.—Cost, $106,373. Cap. Stock: Authorized, $50,000; all paid-up. Paid no div'd in '95. Floating debt, $1,000, at 6%; bonded, $55,000, at 6%, due 1913. Expenses: Operating, $1,961; int., $3,458; taxes, $145. Revenue: Consumers, $5,297; City, fire protection, $1,200. MANAGEMENT.—Prest., John M. Given, Oakmont; Secy., F. W. Hughey, Oakmont; Treas., Henry Berg, Verona; Supt., Geo. H. Moore, Oakmont; Ch. Pump. Engr., John Biggerstaff, Oakmont. Rept. by John M Given, Sept. 3, '96. SEWERS.—None. REFERENCE.—Filter cribs, Eng. News, May 10, '94.

25. **VILLA NOVA,** Delaware Co. (39.) See Berwyn.

319. **VINTONDALE,** Cambria Co. (Not given.) Built in '94 by Vintondale Water Co. Engr., C. R. Claghorn; Contr., U. S. Brooks. FRANCHISE.—Rates not subject to regulation by city. No compensation for public service. No legal difficulties. SUPPLY.—By gravity from impounding reservoir. RESERVOIR.—Cap., 100,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 3 miles. Taps, 100; made by consumer. Services, galv. i.; paid for by owner. Meters, none in use at present. Hydrants, public, 10. PRESSURE.—Ordinary, 40 to 90 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock: Authorized, $10,000. Bonded debt, none. MANAGEMENT.—Prest., W. Delano, Jr.; Secy., A. T. Burr; Treas., T. H. Bechtell; Supt., C. R. Claghorn. Rept. by Supt., Nov. 6, '96. SEWERS.—None.

78. **WALL,** Allegheny Co. (Est., 708.) See East Pittsburg.

D 31. **WALSTON,** Jefferson Co. (Est., 2,000.) Built in '82-3 by Rochester & Pittsburg Coal & Iron Co. to supply their coke ovens and town supply. Two artesian wells and Mahoning River, pumping to tanks. 60,000 galls. Cameron pump. Tanks, cap. 24,000 galls. Mains, 1 mile. Taps, 25. Meters, 0. Pressure, 83 lbs. No rept. since '90-1 Manual.

D 32. **WAPWALLOPEN,** Luzerne Co. (323.) Built in or after '94 by Citizens' Water Co., for domestic supply. Supply, springs, by gravity from small collecting reservoir through about one mile 3-in. pipe, falling some 200 ft. Rept. by M. E. Shorts, Dec. 22, '96.

320, P 27. **WARREN,** Warren Co. (4,332.) Built in '81-2 by Warren Water Co. SUPPLY.—Allegheny and Morrison's Rivers, by gravity and pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; two Knowles dup. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 15 miles. Hydrants, 54. FINANCIAL.—Cost, $132,000. Cap. Stock (in '88), $60,000. Bonded debt, $30,000 at 6%. Revenue: City, $1,080. MANAGEMENT.—Prest., G. C. Orr; Secy. and Supt., W. B. Meredith; Treas., Wm. Pollock. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 10, '83.

PROPOSED MUNICIPAL PLANT.

Plans for extensive municipal plant were prepared in '96 by Hedenberg & Kinsey, 106 Fulton St., N. Y. City. Supreme Court decisions have made suspension of operations necessary. Proposed supply, wells, pumping with 2—3,000,000-gall. pumps to 27.8 (even Nov. 27, '96; latter stated boro. hoped to do something soon. Feb. 15, '97, Com. rept. to Council recommending that steps be taken at once to build works.

229. **WARWICK,** Chester Co. (Township, 1,487.) See Swarthmore.

321. **WASHINGTON,** Washington Co. (7,063.) Built in '87-8 by Citizens' Water Co. Controlled by Kittanning Consolidated Water Co. of Kittanning. Charter perpetual. SUPPLY.—Chartier's Creek pumping from filter wells near impounding reservoir to distributing reservoir. PUMPS.—Cap., 3,000,000 galls.; Deane dup. FILTERS.—Sand. RESERVOIRS.—Cap., 225,000,000 galls.; three impounding and one distributing. DISTRIBUTION.—Mains, 21 miles; cost extensions met by income. Taps, 460. Services, lead; paid for by consumer. Meters: 18; owned, controlled and repaired by Co. Use of meters compulsory for liveries and motors. Co. can compel use of meters and any consumer may have one. Hydrants, public, 46; private, 7. CONSUMPTION.—(Galls.) av., 366,000. PRESSURE.—Ordinary, 90 to 130 lbs. Steam fire engines are used only in case of emergency. FINANCIAL.—Revenue: City, fire protection, $2,000; sewer flushing, $175. MANAGEMENT.—Prest., S. Hazlett; Secy., Jno. A. Fox, Kittaning; Treas., W. Pollock, Kittanning; Supt., J. MacJones; Ch. Pump. Engr., G. S. Buchanan. Rept. by Citizens' Water Co., Aug. 14, '96. SEWERS.—Has sanitary and storm sewers.

322. **WATSONTOWN,** Northumberland Co. (2,157.) Built in '87 by Watsontown Water Co. SUPPLY.—White Deer Creek, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Worthington high pressure. RESERVOIRS.—Cap., 2,000,000 galls.; four. DISTRIBUTION.—Mains, 5 miles. Meters, 0. Hydrants, 34. CONSUMPTION.—(Galls.) av., 300,000. FINANCIAL.—(In '88.) Cost, $40,000. Bonded debt, $40,000 at 6%. Expenses: Operating, $1,000; int., $2,400. Revenue: Consumers, $2,500; City, fire protection, $900. NOTE.—No rept. since '90-1 Manual.

323. **WAYMART,** Wayne Co. (438.) Built in '93 by Waymart Water Co.; put in operation Nov. 1. Engr., Walter Frick, Carbondale. Contrs., Lindsay & Van Loon, Plymouth. SUPPLY.—Springs, flowing into reservoir. RESERVOIR.—Cap., 350,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 40; made by Co. for $4. Services, ¾-in. iron; paid for by consumer. Hydrants, public, 6. FINANCIAL.—Cost, $8,000. Cap. Stock. Authorized, $5,000; all paid-up. Paid no div'd in '95. Floating debt, $2,925; bonded, $2,500 at 5%; due in 1901. MANAGEMENT.—Prest., R. P. Patterson; Secy., G. M. Patterson, both of Carbondale; Treas., A. L. Patterson. Rept. by Secy., Dec. 9, '96.

324, 25. **WAYNE,** Delaware Co. (997.) Built in '81 by Drexel & Childs, proprietors of Wayne estate. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs and driven wells, pumping through mains to reservoir. PUMPS.—Cap., 1,950,000 (?) galls.; 1,750,000 Deane comp. dup.; 200,000 Worthington. (Rept. by makers.) RESERVOIRS.—Cap., 1,000,000 galls.; two 500,000. DISTRIBUTION.—Mains, 8 miles. CONSUMPTION.—(Galls.) av., 242,051. FINANCIAL.—Expenses, operating, $1,240. Revenue, $4,450. NOTE.—No rept. since '90-1 Manual. See also Berwyn Water Co., Berwyn.

325. **WAYNESBOROUGH,** Franklin Co. (3,811.) Built in '82-4 by Waynesborough Water Co. SUPPLY.—Mountain springs, by gravity. RESERVOIR.—Cap., 1,500,000. galls. DISTRIBUTION.—Mains, 9 miles. Taps, 560. Meters, 0. Hydrants, 34. FINANCIAL.—Cost, $75,000. Cap. Stock: Authorized, $80,000. Bonded debt, $38,000, at 6%. NOTE.—No rept. since '90-1 Manual.

326. **WAYNESBURGH,** Greene Co. (2,101.) Built in '87-8 by Waynesburgh Water Co. Property advertised for mortgage sale June 26, '96, by Fidelity Title & Trust Co., Trustee. FRANCHISE.—State law provides for purchase of works by city after 20 yrs. or in 1907. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,700 a yr. for public service. No legal difficulties. SUPPLY.—Ten Mile Creek, pumping to reservoir. Drilled wells are also under trial. PUMPS.—Cap., 1,800,000 galls.; two Smith-Vaile, 1,300,000 and 500,000. Natural gas used. FILTERS.—Cap., not given; broken stone. RESERVOIR.—Cap., 1,000,000 galls.; 250 ft. above town. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by earnings. Taps, 130; made by Co. at consumer's expense. Services, galv. i.; paid for by consumer. Meters, 1; owned by consumer. Use of meters compulsory for public school. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 200,000; max., 800,000; min., 150,000. PRESSURE.—Ordinary, 115 to 130 lbs. FINANCIAL.—Cap. Stock: Authorized, $50,000. Bonded debt, $25,000, at 6%. Expenses: Operating, $2,100; int., $1,500. Revenue: Consumers, unmetered, $2,400; City, fire protection and street sprinkling, $1,280; public buildings, $420. MANAGEMENT.—Prest., Wm. Pollick; Secy. and Treas., John A. Fox, both of Kittanning; Supt., J. A. F. Randolph. Repts. by Supt., June 26 and Dec. 7, '96. PROJECTED IMPROVEMENTS.—Driven wells. SEWERS.—None.

327. **WEATHERLY,** Carbon Co. (2,961.) Built in '81-2 by Weatherly Water Co. SUPPLY.—Penrose Creek and springs, by gravity. RESERVOIR.—Cap., 250,000 galls. DISTRIBUTION.—Mains, 7 miles. Taps, 400. Meters, 0. Hydrants, said to be 150. FI-

NANCIAL.—Cost, $40,000. Cap. Stock, $36,000. Debt, $5,300, at 4½%. Revenue, consumers, $3,000. MANAGEMENT.—Prest., W. W. Blakeslee; Secy., S. G. Eby; Treas., A. J. Landerburn. Rept. by Secy., Sept. 28, '96.

328. **WEISSPORT,** Carbon Co. (456.) Built in '94 by Lehighton Water Co.; put in operation in Nov. FRANCHISE.—5 yrs. from '94. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—From Lehighton Water Co.'s mains. FISCAL YEAR CLOSED July 1, '96. DISTRIBUTION.—Mains, 1¼ miles. Taps, 50; made by Co. for $15, including service connection. Services, lead; paid for by consumer. Meters, 1; owned, controlled and repaired by Co.; yearly rental, none. Any consumer may have a meter; compulsory for large users. Hydrants, public, 7; private, 1. PRESSURE.—Ordinary and fire, 135 lbs. FINANCIAL.—Cost, $4,900. Cap. Stock: Authorized, $5,000; all paid-up. Bonded debt, none. Expenses, operating, $150. Revenue: Consumers, $392; City, fire protection, $200. MANAGEMENT.—Prest., Wm. E. Ash; Secy. and Supt., H. Seaboldt; Treas., D. H. Steaub. Rept. by Secy., Nov. 6, '96. SEWERS.—None.

329. **WELLSBOROUGH,** Tioga Co. (2,961.) Built in '86 by Wellsborough Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. Press rept., Aug., '95, stated new contract for public service had just been closed at $1,500 per yr., against $2,250 for past 10 yrs. SUPPLY.—Spring, by gravity to and from reservoir. FILTERS.—White sandstone crushed to size of peas. RESERVOIR.—Cap., 70,000,000 galls. Flood of May 31, '91, washed out dams. Press rept., June, '92, stated new reservoir about one-third size old one would be completed in a few days. DISTRIBUTION.—Mains, 16 miles. Taps, 258. Meters, 4. Hydrants, 45. FINANCIAL.—Cost, $95,000. Cap. Stock: Authorized, $75,000; all paid-up; paid 6% div'd in '90. Bonded debt, $20,000, at 6%, due in 20 yrs. Expenses, $2,700: Operating, $1,200; int., $1,200; taxes, $300. Revenue, City, fire protection, $2,250. MANAGEMENT.—(Press rept. of election, Jan., '96.) Prest., F. K. Wright; Secy. and Treas., J. Harrison. NOTE.—No official rept. since '90-1 Manual.

330. **WERNERSVILLE,** Berks Co. (Est., 1,000.) Built in '94 by Wernersville Water Co.; put in operation Dec. 25. Des. Engr. and Contr., Edgar B. Kay, Bellwood. Const. Engr., Adam G. Leech. FRANCHISE.—None. Co. operates under charter, place not being incorp. SUPPLY.—Springs on South Mt., by gravity. RESERVOIRS.—Cap., 450,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 100. Services, lead and galv. i. Hydrants, 15. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock, authorized and paid-up, $15,000. No debt. Expenses, operating, $100. Revenue, consumers, $500. MANAGEMENT.—Secy., Adam G. Leech; Supt., E. J. Klopp. Rept. by Engr., Mar. 2, '96. SEWERS.—None.

290. **WEST BETHLEHEM** (P. O., Bethlehem), Northampton Co. Supply from South Bethlehem.

P 28. **WEST BROWNSVILLE,** Washington Co. (735.) Works projected by boro. Engr., Geo. Jenkins, Monongahela. Supply, Monongahela River, pumping to reservoir. Est. cost, $8,000; capital secured. Rept. by Burgess, J. D. S. Pringle, June, '96.

331. **WEST CHESTER,** Chester Co. (8,028.) Built in '45-6 by borough. SUPPLY.—Chester Creek, pumping to reservoir. PUMPS.—Cap., 3,000,000 galls.: 1,000,000 Worthington; 2,000,000 Barr Comp. dup. Bituminous coal used; av. cost, $2.30 per short ton. RESERVOIRS.—Three, cap., 12,000,000 galls. FISCAL YEAR CLOSED Mar. 4, '96. DISTRIBUTION.—Mains, 15 miles. Taps, made by borough. Services, lead; paid for by owner. Meters, 10; owned, controlled and repaired by borough; yearly rental, none. Use of meters optional only with Co.; compulsory for factories. Hydrants, public, 200; private, 4. CONSUMPTION.—(Galls.) av., 500,000; max., 600,000; min., 420,000. PRESSURE.—Ordinary and fire, 25 lbs. Steam fire engines are used. FINANCIAL.—Revenue exceeds expenses by $17,000. MANAGEMENT.—Council: Prest., D. J. Scott; Secy. and Treas., Wm. S. Underwood; Supt., E. A. Mercer. Rept. by M. S. Way, Oct. 3, '96. REFERENCE.—Eng. News, July 8, '82. NOTE.—Press rept., Feb. 24, '97, stated site had been bought for new pumping station on Chester Creek.

51. **WEST CLEARFIELD,** (No P. O.), Clearfield Co. (621.) Supply from Clearfield.

332. **WEST ELIZABETH,** Allegheny Co. (719.) Built in '96 by Elizabeth Water Co.; put in operation June 1. FRANCHISE.—20 yrs. from '95. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes for 10 yrs. City to pay $35 per hydrant per yr. No legal difficulties. SUPPLY.—From Co.'s Elizabeth plant. DISTRIBUTION.—Mains, 1½ miles. Services, lead and iron; paid for by Co. Meters, owned, controlled and repaired by consumer. Use of meters optional with consumer. Hydrants, public, 10. PRESSURE.—Ordinary, 135 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Secy. and Treas., Jno. P. McIntyre, McKeesport, Pa.; Supt., W. F. Daft. Rept. by Secy., July 1, '96. SEWERS.—Has sanitary and storm sewers.

333. **WESTFIELD,** Tioga Co. (1,128.) Built in '93 by borough; put in operation Nov. 1. Engrs., H. S. Lawrence and H. C. Heermans, Corning, N. Y. SUPPLY.—Spring, two miles from town, by gravity from impounding reservoir, and by pumping in dry season. PUMPS.—Cap., 90,000 galls.; Marsh. Bituminous coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., about 550,000 galls. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxation. Taps, 85;

made by borough for $5, including service to curb. Services, galv. 1.; paid for by owner from curb. Meters, 1; owned by consumer; controlled by Co. Borough can compel use of meter and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.), max., 40,000; min., 35,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $16,000, at 5%. Expenses, operating, $75. Revenue: Consumers, $700; City, street sprinkling, $45. Deficits met by taxation. MANAGEMENT.—Borough Council. Chn., L. Plank; Secy. of Council, C. C. Williams; Supt., J. E. Harvey. Rept. by Supt., July 6, '96, and by Secy., Jan. 31, '97. SEWERS.—Has some storm sewers.

D 33. **WEST GROVE,** Chester Co. (1,521.) Owned by Jas. Pyle. Built in '63. No Engr. nor Contr. No legal difficulties. Supply, Spring and well, by gravity and pumping. Wind engine and steam pump. Bituminous coal used; av. cost, $4 per short ton. Filters, cap., 12,000 galls. Reservoirs, cap., 31,000 galls.; 6,000 and 25,000. Fiscal year closed Apr. 1, '96. Mains, 1½ miles. Taps, made by consumer, free. Services, paid for by consumer. Meters, 0. Use of meters optional with consumer. Consumption (galls.), av., 10,000. Pressure, ordinary, 28 lbs. Cost, $6,000. Expenses, operating, $300. Revenue, other purposes, $700. Rept. by John P. Cheyney, Aug. 15, '96. New engine house and new engine projected. No sewers.

133. **WEST INDIANA** (P. O., Indiana), Indiana Co. (1,634.) Supply from Indiana.

247. **WEST LIBERTY,** Butler Co. (241.) Supply from Monongahela Water Co. See Pittsburg.

140. **WESTMONT,** (No P. O.) Cambria Co. See Johnstown.

P 29. **WEST NEW CASTLE** (P. O. New Castle), Lawrence Co. (1,761.) West New Castle Water Co. incorp. Dec. 19, '96, with authorized cap. stock of $1,000. Treas., Jno. C. Wallace, New Castle.

334. **WEST NEWTON,** Westmoreland Co. (2,285.) Built by Weddle & Sutton, merchant millers. FRANCHISE.—Unlimited. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Deep wells, pumping to tank. PUMPS.—Cap., 90,000 galls; 3—30,000 Laidlaw & Dunn. Coal used; av. cost, $0.50 per short ton. TANK.—Cap., 220,500; steel; on 130 ft. elevation. DISTRIBUTION.—Services, galv. 1. Meters: 10; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for steam users. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 3. Water is of superior quality and chiefly used for household supply. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost est., $4,000. MANAGEMENT.—Rept. by Weddle & Suttton, Aug. 24, '96. SEWERS.—Partial system of sanitary and storm sewers.

249. **WEST PITTSTON** (P. O. Pittston), Luzerne Co. (3,906.) Supply from Pittston.

D 34. **WEST READING,** Berks Co. (Est., 650.) Built in '86 by West Reading Water Co. Supply, Schuylkill River, pumping to tanks. Pump, No. 5 Guild & Garrison. Filters, cap., 250,000 galls.; Warren. Rept. by makers as put in operation Dec. 28, '96. Tanks, cap., 50,000 galls.; 2—25,000. Mains, 3 miles; 4-in. Taps, 150. Consumption (galls.), av., 30,000. Pressure, ordinary, 50 lbs. Cost, $10,000. Cap. Stock, authorized, $10,000. No debt. No rept. since '90-1 Manual.

D 35. **WHITE HAVEN,** Luzerne Co. (1,684.) Owned by White Haven Water Co. since '65, which then bought works from borough. Franchise does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. not exempt from local taxes. No legal difficulties. Supply, mountain springs, by gravity (and pumping ?). Pumps, cap., 400,000 galls.; Deane water power dup. (Rept. by maker as sold in '96 for use here.) Reservoirs, cap., 2,500,000 galls.; 2,000,000 impounding; 2—500,000 distributing. Fiscal year closed Nov. 1, '95. Mains, 5½ miles; cost extensions met by income. Taps, 262; made by consumer, no fee. Services, lead and galv. 1. Consumption, (galls.), av., 150,000. Steam fire engines are used. Cost, $15,000. Cap. Stock: Authorized, $25,000; paid-up, $15,000; paid 6% div'd in '95. Floating debt, $3,500 at 6%; bonded, none. Expenses, $969: Operating, $550; int., $210; taxes, $109. Prest., Chas. L. Keck; Secy. and Treas., M. G. Peters; Supt., H. J. Meyers. Rept. by Prest., Aug. 14, '96. Sewers, none.

161. **WICONISCO,** Dauphin Co. (2,280.) Supply from Lykens.

335, 336, 337. **WILKES-BARRE,** Luzerne Co. (37,718.)

WILKES-BARRE WATER CO.

Built in '57-9. Now controlled by Spring Brook Water Supply Co.; see below. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Laurel River, by gravity and pumping to reservoirs. PUMPS.—Cap., 4,000,000 galls.; Worthington comp. cond. FILTERS.—Cap., 10,000,000 galls.; Jewell. RESERVOIRS.—Cap., 2,046,000,000 galls. Laurel Run Intake No. 1: 10,000,000; area, about 5 acres. Laurel Run Storage No. 2: About 30,000,000; area, about 5 acres. Intake No. 3, 6,000,000; area, 1½ acres. Toby's Creek Storage, No. 4: 2,000,000,000; area, 396 acres. DISTRIBUTION.—(In '88.) Mains, 45 miles. Taps, 4,100. Meters, 4. Hydrants, 100. FINANCIAL.—Withheld.

CRYSTAL SPRINGS WATER CO.'S WORKS.

Now controlled by Spring Brook Water Supply Co.; see below. Supplies part of city and Ashley. A 4,000,000-gall. Jewell filter plant was installed here in '95, but for reasons independent of filtration is not in use. REFERENCES.—Eng. News, Nov. 26, '81; Jewell filters, May 21, '96, illus.

SPRING BROOK WATER SUPPLY CO.

(General Explanatory Note.—Controls the Cos. supplying Wilkes-Barre (see above) and most or all of those in the valley from there to Scranton, including the People's Water Co., which supplies a part of the 20th ward of Scranton. Aside from the Cos. indicated, the principal ones controlled are those at Pitttston and Plymouth. Parent Co. gave Cos. controlled by it and places supplied in two separate lists, so the connections between Cos. and municipalities cannot be indicated throughout. Where this is possible it has been done under the several localities, in their proper alphabetical order. It is also impossible to indicate with certainty the present sources of supply of the several places, and in general the character and extent of the works, owing to the fact that only one general rept., giving aggregates, has been made by the parent Co. Some of the old works, described in previous Manuals, doubtless have new sources of supply, while others retain the original supplies. For the reasons stated above, the information given in earlier Manuals is repeated in this under the several plants previously described, corrected to date in case local officials have given later information.—Ed.)

The Spring Brook Water Supply Co. controls the following named local Cos.: Bellevue, Citizens', Clear Brook, Crystal Springs, Edwardsville, Forty Fort, Hanover, Luzerne, Minooka, Moosic, Mountain Brook, People's of Pittston, People's of Scranton, Rendham, Shawnee, Spring Brook, Taylorville, Toby's Creek, Valley, West Side, Wilkes-Barre and Wyoming.

The places supplied are as follows: Ashley, Avoca, Bellevue Heights, Dorrancetown, Duryea, Edwardsville, Exeter, Forty Fort, Hanover, Hughestown, Kingstown, Lackawanna, Luzerne, Marcy, Miners' Hill, Minooka, Moosic, Old Forge Township, Parsons, Pittston, Plains, Plymouth, Rendham, part of 20th ward of Scranton, Sugar Notch, Taylor, Wilkes-Barre, Wyoming Borough and Yatesville.

FRANCHISE.—Co. operates works under various franchises. Rates not subject to regulation by towns supplied. SUPPLY.—Numerous mountain streams, by gravity and pumping from Susquehanna River. (See note.) PUMPS.—Cap., 25,000,000 galls.; Holly, Janesville, etc. FILTER CRIB.—See note. RESERVOIRS.—Cap., 4,228,490,000 galls.; 20 storage. (See note.) DISTRIBUTION.—Mains, 350 miles; cost extensions met by reserve bonds. Taps made by Co. for $5. Services paid for by consumer. Meters, a few; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, 438. CONSUMPTION.—(Galls.) av., 25,000,000. PRESSURE.—Ordinary, 50 to 125 lbs. FINANCIAL.—Cap. Stock: Common, authorized, $5,000,000; all paid-up. Bonded debt, $3,657,000 at 5%, due 1926; $350,000 at 6%, due at different times. MANAGEMENT.—Prest., L. A. Watres; Secy., T. H. Watkins; Treas., R. C. Adams; Gen. Man., O. M. Lance, Wilkes-Barre. Rept. by Treas., Nov. 19, '96. NOTE.—Alex. Potter, 137 Broadway, was appointed as Ch. Engr. of Co. in '96 and repts. the following early in '97: A 15,000,000-gallon pumping station was built on the Susquehanna River in '96, drawing water from 100 × 450 ft. submerged filter crib, through 36-in. suction pipe 2,000 ft. long. Force main to Wilkes-Barre, 30-in., 8 miles long. Designs have been made for two reservoirs to be constructed in '97: A 3,000,000,000-gall. storage near head waters of Spring Creek, and a 200,000,000-gall. impounding on Mill Creek.

338. **WILKINSBURG** (Station D., Pittsburg P. O.), Allegheny Co. (4,662.) Built in '88-9 by Pennsylvania Water Co. Supplies 37th ward of Pittsburg (formerly Brushton), the boroughs of Wilkinsburg, Edgewood and Rankin, and the townships of Sterrett, Braddock, Penn and Wilkins. FRANCHISE.—999 yrs. from '87; provides for purchase of works by city after 1927. Maximum rates are fixed in franchise. Co. is exempt from state tax only. City to pay hydrant rental. No legal difficulties. SUPPLY.—Allegheny River, pumping to reservoir. PUMPS.—Cap., 6,000,000 galls.; Deane comp. cond. Bituminous coal used; av. cost, $1.25 per short ton. RESERVOIR.—Cap., 6,000,000 galls.; distributing. FISCAL YEAR CLOSED Mar. 31, '96. DISTRIBUTION.—Mains, 34 miles; cost extensions met by income on stock. Taps, 2,247; made by Co., free. Services, lead; paid for by consumer. Meters: 1,100; owned by consumer; controlled by Co.; repairs paid by consumer. Use of meters compulsory for all services since April 1, '96. Hydrants, not given. CONSUMPTION.—(Galls.) av., 990,000; max., 1,750,000. PRESSURE.—Ordinary and fire, 120 lbs. FINANCIAL.—Cap. Stock: Common, authorized, $200,000; all paid-up. Pref'd, authorized, $76,000; all paid-up; paid 6% div'd in '95. Bonded debt, $100,000 at 6%; due 1918. Expenses, $24,669. Revenue, $35,764. MANAGEMENT.—Prest., Jas. H. Harlow; Secy., E. Price; Treas., A. W. Duff; Supt., W. A. Alexander; Ch. Pump. Engr., A. Alexander, Jr., Nadine. Rept. by Secy., July 6, '96. PROJECTED IMPROVEMENTS.—5,000,000-gall. pumping engine, filter crib in river and additional mains. SEWERS.—Has sanitary sewers.

338. **WILKINS TOWNSHIP**, Allegheny Co. (2,304.) See Wilkinsburg.

P 30. **WILLIAMSBURG**, Blair Co. (888.) Projected by Williamsburg Water Co., which was incorp. Dec. 19, '95, with authorized cap. stock of $20,000. Apparently con-

tract for 15 hydrants has been secured. Supply springs, three miles distant, by gravity. Address O. Gardner, Hollidaysburg. Rept. by J. R. Sholiar, Council Clk., June 25, '96.

389. **WILLIAMSPORT**, Lycoming Co. (27,132.) Owned and operated by Williamsport Water Co. and Citizens' Water & Gas Co. Williamsport Water Co. incorp. in '58 and built works in '58-9. In '65 Lycoming Gas & Water Co., now Citizens' Co., was incorp. Both Cos. now under one management. FRANCHISES.—Perpetual. Provide for purchase of works by city. Terms specified. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes, except $100 license tax. City to pay $10 per hydrant per yr. SUPPLY.—Mountain streams, by gravity and pumping from wells. March, '96, Co. repts. it has let contract for 12,500 ft. 16-in. mains to be laid through city to connect two plants. PUMPS.—Cap., 8,000,000 galls.; 250,000 Deane triplex water-power; 6,000,000 Blake or Knowles. Bituminous coal used; av. cost, $1.75 per short ton. RESERVOIRS.—Cap., 27,600,000 galls.; 6,600,000, 21,000,000; area of latter, 6 acres. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 69 miles; cost extensions met by stock. Taps made by Co. for $1. Services, galv. i.; paid for by consumer. Meters: 55; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co.; compulsory for factories, liveries and hotels. Hydrants, public, 257; private, 55. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are seldom used. FINANCIAL.—Cap. Stock: Authorized, $900,000; paid-up, $770,000. MANAGEMENT.—Prest., J. V. Brown; Secy. and Treas., W. H. Bloom; Rept. by Secy., June 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 30, '81.

D 36. **WILLIAMSTOWN**, Dauphin Co. (2,324.) Gravity works built by Williamstown Water Co., date not given. About 2 miles of mains in '90. Address G. H. Bonk or Jno. Lynch. Press rept., Feb. 10, '97, stated there was a move for erection of complete works.

78. **WILMERDING**, Allegheny Co. (419.) See East Pittsburg.

340. **WOMELSDORF**, Berks Co. (1,141.) Built in '95 by Womelsdorf Water Co.; put in operation in '96. SUPPLY.—Mountain stream, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Worthington. FILTERS.—Cap. not given; natural. RESERVOIR.—Cap., 800,000 galls. DISTRIBUTION.—Mains, 2½ miles. Service;, w. i. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $15,000. Bonded debt, $15,000, at 5%. MANAGEMENT.—Prest., P. D. Wanner; Secy. and Treas., R. B. Kinsey, both of Reading; Supt., W. D. Filbert. Rept. by Secy., Jan. 18, '97.

— ? **WORMLEYSBURG**, Cumberland Co. (555.) Built in '92 (?) to supply towns across river from Harrisburg. No further information.

341. **WYALUSING**, Bradford Co. (428.) Built in '98 by Wyalusing Water Co. SUPPLY.—Mountain stream, by gravity. DISTRIBUTION.—Hydrants, public, 9. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cap. Stock: Authorized, $18,000. MANAGEMENT.—Prest., Jacob Stroud, Black Walnut; Treas., J. W. Wilcox, Scranton. SEWERS.—Has sanitary and storm sewers.

135. **WYNCOTE**, Montgomery Co. See Jenkintown.

37. **WYNNEWOOD**, Montgomery Co. See Bryn Mawr.

337. **WYOMING BOROUGH**, Luzerne Co. (1,794.) See Spring Brook Water Supply Co., Wilkes-Barre.

P 31. **WYOMISSING** (P. O. Reading), Berks Co. (Not given.) Projected or under construction by Co. latter part of '96 to supply new town. Engr., Wm. H. Dechant; Contr., H. E. Ahrens, both of Reading. Rept. by Contr., Sept. 8, '96. Supply, spring, lifted by ram.

P 32. **YARDLEY**, Bucks Co. (813.) Dec. 15, '96, boro. council appointed Com. to rept. on works at future meeting of citizens. Rept. by Chas. T. Eastburn, Secy., Dec. 16, '96.

337. **YATESVILLE** (P. O. Yates), Luzerne Co. (414.) See Spring Brook Water Supply Co., Wilkes-Barre.

342. **YORK**, York Co. (20,793.) Built in '16 by York Water Co. Works enlarged in '96. Engr., Chas. A. Hague, 39 Cortlandt St., N. Y. City. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs, by gravity and pumping from stream. PUMPS.—Cap., about 11,000,000 galls.; 2—5,000,000 Worthington trip. exp.; also Deane and Berkinbine, rept. in '89 as aggregating about 1,000,000. RESERVOIRS.—Cap., 31,250,000 galls.; 11,000,000 and 20,250,000. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 29 miles. Taps, 6,000; made by Co. Services, lead; paid for by owner. Meters, 30; owned, controlled and repaired by Co. Use of meters compulsory for factories and hotels. Hydrants, public, 162. CONSUMPTION.—(Galls.), max., 2,750,000; min., 2,000,000. PRESSURE.—Ordinary, 10 to 45 lbs. Steam fire engines are used. FINANCIAL.—Cost, $250,000. Cap. Stock: Authorized, $250,000; all paid-up. MANAGEMENT.—Prest., J. Carl; Secy., I. Williams; Treas., W. H. Griffith; Supt., J. L. Kuehn. Rept. by Supt., June 7, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Mar. 18, '82; reservoir and improvements, Sept. 3, '96, illus.

343. **YORKVILLE** (P. O., Pottsville), Schuylkill Co. (916). Distributing system built in '91 by borough. Engrs., A. B. Cochran & Son, Pottsville. SUPPLY.—From

Pottsville Water Co. system, through meter. DISTRIBUTION.—Mains, 2.2 miles. Hydrants, 12. FINANCIAL.—Cost, $10,000. Debt, $10,000, at 4%. MANAGEMENT.—(In '92.) Prest., Martin Otterbine; Supt., Christian Schenk. NOTE.—Above rept. made in Feb., '92, by Const. Engrs.

DELAWARE.

P 1. **DELAWARE CITY,** New Castle Co. (969.) Projected by a Co. Engr., C. Taylor Leland, Quakerstown, Pa. Supply, wells, pumping to stand-pipe. Rept. by Mayor, Geo. B. Money, Nov., '96.

1. **DOVER,** Kent Co. (3,061.) Built in '82 by town. SUPPLY.—Two surface and two artesian wells, pumping direct. Surface wells are 15 × 24 and 20 × 28 ft. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup. Anthracite pea coal used; av. cost, $3.45 per short ton, delivered. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by appropriations from water fund. Taps, 333; made by town for $2. Services, galv. i.; paid for by property owner. Meters, 2; owned, controlled and repaired by town. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 136,363. PRESSURE.—Ordinary, 45 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $28,000. Bonded debt, $15,000, at 4%, due 1900. Expenses: Operating, $3,000; int., $600. Revenue, $4,270. MANAGEMENT.—Supt., Wm. H. Hazel. Rept. by T. F. Cooke, Ch. Pump. Engr., Aug., '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 16, '82.

P 2. **LAUREL,** Sussex Co. (2,388.) Press rept. stated citizens' meeting would be held Jan. 21 to discuss building works.

2. **MIDDLETOWN,** New Castle Co. (1,454.) Built in '88 by town. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 850,000 galls.; Worthington comp. non-cond., 500,000, and American Water-Works dup., 350,000. Bituminous coal used; av. cost, $2.80 per short ton. STAND-PIPE.—Cap., 37,500 galls.; iron; 8 × 100 ft., on ground. FISCAL YEAR CLOSED Feb. 21. DISTRIBUTION.—Mains, 2 miles; cost extensions met by income or taxation. Taps (in '90), 111; made by town to curb for $5. Services, iron; paid for by owner. Use of meters optional with town. Hydrants, public, 23. PRESSURE.—Ordinary, 35 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $27,445. Bonded debt, $21,000, at 5%, due $1,000 each year. Expenses: Operating, $1,757; int., $1,050. Revenue: Consumers, $788; City, fire protection, $525. Being operated in connection with light plant the deficit, excepting interest, which is met by taxation, is paid by profits of latter. MANAGEMENT.—Prest., Sewell C. Biggs; Secy., John W. Jolls; Treas., L. Darlington; Supt., Theo. Whitlock; Ch. Pump. Engr., Chas. A. Johnson. Rept. by Secy., June 9, '96. SEWERS.—None.

3. **MILFORD,** Kent Co. (1,226.) Built by town. SUPPLY.—Artesian wells, pumping to tank. One 10-in., 3—6-in. wells. PUMPS.—Cap., 750,000 galls.; Smith-Vaile. Elk Garden coal used; av. cost, $2.89 per short ton. STAND-PIPE.—Cap., 35,000 galls.; iron, 8 × 100 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by revenue. Taps, made by town for $1.50. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 35,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $40,000, at 5%, due 1911, including light bonds. Sinking Fund, $700. Expenses: Operating (including electric light plant), $9,651; int., $2,105; taxes, $64. Revenue: Consumers, unmetered, $1,865; City, fire protection, $1,000. MANAGEMENT.—Prest., Nathan Pratt; Secy., Dr. Geo. W. Marshall; Treas., Chas. Barker. Rept. by Supt., W. Thos. Banning, June 23, '96. PROJECTED IMPROVEMENTS.—Extension of mains. SEWERS.—Has storm sewers only.

4. **NEWARK,** New Castle Co. (1,191.) Built in '88 by town. SUPPLY.—Well, pumping to stand-pipe and direct. Well is 25 × 35 ft. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Holly hor. dup. Cumberland coal used; av. cost, $2.67 per short ton. STAND-PIPE.—Cap., 155,400 galls.; 23 × 50 ft., on concrete foundation; about one mile from pump, with top 140 ft. above lower parts of town. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Taps, made by town. Services, galv. i.; paid for by consumer. Meters, 1; owned by town. Use of meters compulsory for factories. Town can compel use of meters and any consumer may have one. Hydrants, public, 36; private, 1. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Floating debt, $1,400; bonded, $37,000, at 5%, due '96. Expenses, $3,212: Operating, $1,292; int., $1,920. Revenue, $2,296: Consumers, $1,366; mis., $30; City, fire protection, $900. Deficit of $925 (int.) paid by town appropriation. MANAGEMENT.—Prest., C. M. Allmond; Secy. and Treas., G. W. Williams. Rept. by Supt. and Gen. Mgr., A. Homewood, June 10, '96. SEWERS.—None.

5. **NEW CASTLE,** New Castle Co. (4,010.) Built in '70 by New Castle Water-Works Co. SUPPLY.—None Such Creek, pumping to reservoir. PUMPS.—Cap., 2,500,000 galls.; 750,000 Blake; 1,750,000 Davidson. RESERVOIR.—Cap., 1,250,000 galls.; 92 ft. above city. DISTRIBUTION.—Mains, 8.5 miles. Taps, 507. Services, iron. Meters, 0. Hydrants, 40. CONSUMPTION.—(Galls.) av., 450,000. PRESSURE.—Ordinary, 26 lbs. FI-

NANCIAL.—Cost, $112,000. Bonded debt, $54,000, at 5%. Expenses, $7,200: Operating, $4,500; int., $2,700. Revenue, consumers, $8,000. NOTE.—No rept. since '89-90 Manual. REFERENCE.—Eng. News, Dec. 23, '82.

6. **SMYRNA,** Kent Co. (2,455.) Built in '86 by town. SUPPLY.—Surface well, pumping to stand-pipe and direct. PUMPS.—Cap., 845,000 galls.; two Gordon comp. dup. STAND-PIPE.—Cap., 37,600 galls.; 8 x 100 ft. FISCAL YEAR CLOSED Feb. 4. DISTRIBUTION.—Mains, 3.5 miles. Taps, 288. Meters, 0. Hydrants, 34. CONSUMPTION.—(Galls.), av. 50,000. FINANCIAL.—(In '89.) Cost, $24,000. Bonded debt, $24,000, at 4%. Expenses, $2,172: Operating, $1,212; int., $960. Revenue, consumers, $2,082. MANAGEMENT.—Comrs. Supt., F. L. Wright. Rept. by Secy., H. D. Boyer, Sept. 26, '96.

7. **WILMINGTON,** New Castle Co. (61,431.) Bought by city in '10; built in '04 by Wilmington Spring Water Co. SUPPLY.—Brandywine Creek, pumping to reservoirs, with repumping for high service reservoirs. Creek falls 120 ft. in 4 miles just above city. PUMPS.—Cap., 19,000,000 galls.; Worthington hor. comp. high duty, 7,000,000; Corliss, 10,000,000; water-power pump, 2,000,000. Cumberland coal used; av. cost, $2.60 per short ton. FILTERS.—Cap., 10,000,000 galls.; United States; open gravity sand filter. RESERVOIRS.—Cap., 41,500,000 galls.: Low service, 40,000,000; high service, 1,500,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 89 miles; cost extensions met by receipts. Taps, 14,201; made by city, at $2 for ½-in., $2.50 for ¾-in., $3 for ¾-in. and $4 for 1-in. Services, lead; paid for by property owner. Meters: 480; owned, city, 450; consumer, 30; controlled and repaired by city. Use of meters optional with city; compulsory for manufacturers, stables, hotels, saloons and public buildings. Hydrants, public, 679. CONSUMPTION.—(Galls.) av., 5,829,040; max., 7,055,720; min., 4,681,950. PRESSURE.—Ordinary, 10 to 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,500,000. Expenses: Operating, $56,535; int., $8,405. Revenue: Consumers, unmetered, $117,902; metered, $33,163; other purposes, $9,118. No deficits. Surplus for '95, $78,408 paid over to Mayor and council to pay water bonds. MANAGEMENT.—Prest., Wm. T. Porter; Secy., John D. Grohe; Treas., Jas. K. Adams. Rept. by Supt., Jas. A. Bond, July 14, '96. SEWERS.—Has sanitary and partial system of storm sewers. REFERENCE.—Eng. News, Sept. 17, '81.

MARYLAND.

P 1. **ABERDEEN,** Harford Co. (448.) Press rept., Dec., '96, stated surveys and plans for works were to be made by Horatio Sands, Pottstown, Pa., and that G. H. Ivins, Town Comr., should be addressed for information. Dec. 21, W. A. Wells rept. that no definite information could be given.

1. **ANNAPOLIS,** Anne Arundel Co. (7,604.) Built in '65-6 by Annapolis Water Co. Press rept., Oct., '96, stated that of 1,229 shares of stock the state of Md. owned 600, the city of Annapolis, 200, balance being held by individuals. Works improved in '94; Consult. Engrs., Jas. H. Harlow & Co., Pittsburg. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Springs and brooks, pumping from impounding to distributing reservoir. PUMPS.—1,500,000 Nordberg hor. cross-comp. cond. Two Worthington comp. pumps were in use in '95. RESERVOIRS.—Cap., 7,250,000 galls.; two: 6,000,000 and 1,250,000. In addition, an impounding reservoir was built in '95. DISTRIBUTION.—Mains, 13 miles. Taps (in '90), 525. Services, galv. i. Hydrants (in '90), 42. FINANCIAL.—Cost, about, $105,000. Cap. Stock, paid-up, $61,450; paid no div'd in '95. Debt, $45,566: Floating, $10,566; bonded, $35,000. Expenses, $13,880: Operating, $10,708; int., $1,810; taxes, $862. Revenue, $22,323; City, $185. MANAGEMENT.—Prest., L. D. Gassaway; Secy. and Treas., W. H. Green; Supt., W. F. Williams. Information from Co.'s annual rept. for '95. REFERENCE.—Eng. News, Sept. 30, '82.

2. **BALTIMORE,** Baltimore City Co. (434,439.) Bought by city in '54 for $1,350,000; Built in '07 by Co. SUPPLY.—Impounding reservoirs at Jones Falls and Great Gunpowder Falls, by gravity for low service, and pumping to reservoirs for high service. PUMPS.—Cap., 21,000,000 galls.; Worthington: 2—3,000,000 comp. cond., 1—5,000,000 and 1—10,000,000 hor. comp. high duty. Anthracite and bituminous coal used; av. cost of former, $4.50; latter, $2.50 per short ton. RESERVOIRS.—Cap., 2,310,000,000 galls. Two impounding and two storage, total cap., 1,460,000,000; five distributing, total cap., 850,000,000. CONDUITS.—An elliptical brick conduit, with cross-sectional area of 24.75 ft. and length of 3.62 miles, leads from Lake Roland, at Jones Falls, to Hampden reservoir. Two lines of 30-in. c. i. pipe, 7,100 ft. long, lead from Hampden to Mt. Royal reservoir. A tunnel 12 ft. in diam., 36,500 ft. long, with fall of 1 ft. per mile, connects Lock Haven, at Great Gunpowder Falls, with Lake Montebella. From 65 to 300 ft. below surface, largely through rock, only 11,691 ft. being arched. Total cost, $1,780,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 523 miles; cost extensions met by receipts. Taps (in '90), 74,728; made by city for $6 to $12. Services, w. i.; paid for by consumer. Meters: 1,155; owned by consumer; controlled and repaired by city. Use of meters optional with consumer; compulsory for manufacturers.

Hydrants, public, 1,600. CONSUMPTION.—(Galls.) av., 57,000,000; max., 65,000,000; min., 50,000,000. Steam fire engines are used. FINANCIAL.—Cost, $12,905,508. Bonded debt, $6,500,000: $1,500,000, at 4%; due $1,000,000 in 1926; $500,000 in 1922; $5,000,000, at 5%; due 1916. Expenses, $469,628: Operating, $159,628; int., $310,000. Revenue, $774,657: Consumers, unmetered, $395,282; metered, $168,974; misc., $49,515; City, fire protection, $17,805 (balance from previous yrs., no appropriation for '95). MANAGEMENT.—Prest., Alcaeus Hooper, Mayor; Secy., Walker B. Swindell; Water Regr., Jas. A. Marrian; Ch. Engr., Wm. L. Kenly (Jan. 15, '97, Mr. Kenly resigned and was appointed Consulting Engineer; N. S. Hill, Jr., was appointed Chief Engineer); Ch. Pump. Engr., M. C. Barclay. Rept. by First Asst. Engr., Wm. Benthall, June 9, '96. PROJECTED IMPROVEMENTS.—Extension of mains, pumping engines, in accordance with recommendations by S. M. Gray, Providence, R. I. Feb. 1, '97, bids were received for 2—17,500,000, 1—10,000,000 and 2—1,500,000 pumps. Press rept., Feb. 9, '97, stated contracts for the three largest pumps had been awarded to Henry R. Worthington, and that the smaller ones would not be put in. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 16, '81.

8. **BEL AIR,** Harford Co. (1,416.) Built in '90 by Bel Air Water & Light Co.; put in operation Oct. 1. SUPPLY.—Spring, by gravity to reservoir. RESERVOIR.—Cap., 1,700,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 225. Meters, 10. Hydrants, public, 40. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $40,000. Int., 6%. Revenue: City, fire protection, $800. (Press rept., Feb., '97, stated that on Co.'s annual meeting receipts for yr. ending Jan. 31,'97, were, $5,036, and net income, $2,473.) MANAGEMENT.—Prest., Otho S. Lee; Secy., Geo. R. Cairnes; Supt., John S. Dallam. Rept. by Treas., Richard Dallam, Sept., 28, '96.

P 2. **BRUNSWICK,** Frederick Co. (Not given.) A 20-yr. franchise has been granted to Brunswick Pure Water Co., but sufficient subscribers have not been secured to warrant construction. Co. owns reservoir on South Mt. Rept. by Thos. J. Cannon, 1516 Mulberry St., Baltimore, Oct. 5, '96. Works rept. in '90-1 Manual apparently never built.

4. **CAMBRIDGE,** Dorchester Co. (4,192.) Built in '93 by Cambridge Water Co. Engr., I. S. Cassin. FRANCHISE.—39 yrs. from '93. Rates are subject to regulation by city. Co. is exempt fom local taxes. City to pay $1,300 per yr. for public service. SUPPLY.—Artesian wells, natural flow of 13,000 galls. per hour, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. Coal used; av. cost, $3.15 per short ton. STAND-PIPE.—Cap., 115,000 galls.; 14 × 100 ft. DISTRIBUTION.—Mains, 7 miles; cost extensions met by revenue. Taps, about 575; made by Co. Services, galv. i.; paid for by Co. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 42 to 46 lbs. One steam fire engine is owned by town, but has not been used since works were built. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jas. Wallace. Rept. by Supt., G. Warren Mundy, Dec. 26, '96.

5. **CANTON AND HIGHLANDTOWN** (P. O. Baltimore), Baltimore Co.? (Not given.) Built in '96 (?) by Co. SUPPLY.—Filter crib in Herring Run, pumping to stand-pipe at Highlandtown. PUMPS.—Cap., 2,000,000 galls, 2—1,000,000 Worthington; a comp. cond. and a non-comp. non-cond.; rept. by makers.

6. **CATONSVILLE,** Baltimore Co. (2,115.) Built in '87 by Catonsville Water Co. SUPPLY.—Artesian well and stream, pumping to tank. PUMPS.—Cap., 400,000 galls.; deep well Deane. (A 750,000 Worthington comp. non-cond. rept. by makers.) FILTERS. Cap., 250,000 galls.; New York; rept., by makers. TANKS.—Cap., 670,000 galls.; two 185,000 and 485,000. DISTRIBUTION.—Mains, 10 miles. Taps, 150. Hydrants, 10. FINANCIAL.—Cost, $90,000. Cap. Stock: Authorized, $60,000. No debt. Revenue, $7,000. MANAGEMENT.—(Press rept. of election, May, '95.) Prest. and Gen. Mgr., C. C. Speed; Secy., Wm. G. Speed. NOTE.—No rept. since '90-1 Manual.

7. **CENTREVILLE,** Queen Anne Co. (1,309.) Built in '89 by town. SUPPLY.—Stream, pumping to stand-pipe, filtered. PUMPS.—Cap., 750,000 galls.; Knowles. STAND-PIPE.—Cap., 34,000 galls.; 8 × 90 ft. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 25 miles. Hydrants, 40. FINANCIAL.—Bonded debt, $15,000, at 5%; due 1907. MANAGEMENT.—Comrs. NOTE.—No rept. since '90-1 Manual.

8. **CHESTERTOWN,** Kent Co. (2,632.) Built in '85 by Chestertown Water Co. FRANCHISE.—40 yrs. from '84; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. No legal difficulties. SUPPLY.—Natural springs, gathered in pools and pumped through town system to reservoir. PUMPS.—Cap., 150,000 galls.; Deane comp. dup. Bituminous coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles; cost extensions met by Co. out of income. Taps made by consumer. Services, galv. i.; paid for by owner. Meters, owned by Co. Use of meters compulsory for boilers. Hydrants, public, 31. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 30 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock: Authorized, $10,000; all paid-up; paid no div'd in '95. Pref'd, authorized, $5,000; all paid-up; no div'd guaranteed. Bonded debt, $15,000, at 6%. Expenses: Operating, $2,000. Revenue: City, fire protection, $2,000. MANAGEMENT.—Prest., Chas. T. Westcott; Secy. and Treas., M. W. Thomas. SEWERS.—Partial system of sanitary sewers. REFERENCE.—Eng. News, Jan. 30, '86.

P 8. **CRISFIELD,** Somerset Co. (1,565.) Projected by town. Supply, wells, pumping to elevated tank. Est. cost, $12,000. Construction will probably be in charge of H. S. York. Rept. by Clk. Comrs., John E. Sterling, Dec. 22, '96.

9. **CUMBERLAND,** Allegany Co. (12,729.) Built in '70-1 by city. SUPPLY.—Potomac River, pumping direct. PUMPS.—Cap., 6,000,000 galls: 2,000,000 Holly quadruplex; 4,000,000 Holly-Gaskill hor. high duty. FISCAL YEAR CLOSED March 31, '96. DISTRIBUTION.—Mains, 18.3 miles. Taps, 2,191. Meters, 35. Hydrants, public, 156. CONSUMPTION.—(Galls.) av., 174,240. PRESSURE.—Av. dynamic head on pumps, 75 lbs. FINANCIAL.—Cost (in '90), $150,000. Expenses, operating, $9,459. Revenue: Consumers, $17,389. MANAGEMENT.—Council. Mayor, J. B. Humbird; Secy., J. W. Galbreath; Supt., S. Ousborn. Information from annual reports for '95. PROJECTED IMPROVEMENTS.—Filters have been under discussion for some time. Latter part of '96, Churchill Hungerford, 5 Beekman St., N. Y. City, was engaged to rept. on filtration. REFERENCE.—Eng. News, Jan. 6, '83.

10. **CURTIS BAY** (P. O. Baltimore), Anne Arundel Co. (Not given.) Built about '92 or '93 by Brooklyn & Curtis Bay Light & Water Co. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 240,000 galls. STAND-PIPE.—Cap., 120,000 galls.; 15 × 80 ft. DISTRIBUTION.—Hydrants, 35. PRESSURE.—Ordinary, 120 lbs. NOTE.—Above from press rept. Aug., '98.

11. **EASTON,** Talbot Co. (2,939.) Built in '86 by Easton Water Co. FRANCHISE.—Perpetual. Provides for purchase of half interest in works by city after 10 yrs. from date of erection. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay 8 cts. on $100, assessable property of the town, less 5% for collection, for fire hydrants and fire purposes, drinking fountains, etc. No legal difficulties. SUPPLY.—Six artesian wells, pumping to stand-pipe; also reservoir fed from springs held in reserve for fire purposes. PUMPS.—Cap., 750,000 galls.; 250,000 and 500,000 Holly hor. dup. Cumberland coal used; av. cost, $3.25 per short ton. RESERVOIRS.—Cap., 135,000 galls. STAND-PIPE.—Cap., 85,000 galls.; iron; 12 × 100 ft., on granite foundation. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 6½ miles. Taps, 277; made by Co. for $1.50. Services, ¾-in. galv. i.; paid for by property owner. Meters: 1; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for steam laundry. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 100,000; max., 50,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. Steam fire engines are used. FINANCIAL.—Cost, $40,000 to $50,000. Cap. Stock: Authorized, $50,000; all paid-up; paid 2½% div'd in '95. Bonded debt, $30,000, at 5%; due 1922. Expenses: Operating, $1,500; int., $1,500; taxes, included in operating expenses. Revenue: City, fire protection, $1,100. MANAGEMENT.—Prest., Joseph H. White; Treas., Robt. B. Dixon. Rept. by Secy. and Mgr., Wm. E. Shannahan, Aug. 22, '96. SEWERS.—None.

12. **ELKTON,** Cecil Co. (2,818.) Built in '92 by Maryland Water Co., of Cecil County, the Elkton Water Co. transferring its franchise to above Co. before works were built. Engr., Isaac M. Cassin, Philadelphia. Contrs., Jos. G. Johnson & Son, Baltimore. SUPPLY.—Artesian wells, pumping to reservoir. PUMPS.—Cap., 570,000 galls.; Deane dup.; rept. by maker as installed in '92. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Hydrants, 49. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cap. Stock, $30,000. MANAGEMENT.—(Jan., '95.) Prest., W. T. Warburton; Secy. and Treas., R. V. Levis. NOTE.—Above from press repts.

13. **FREDERICK,** Frederick Co. (8,193.) Built in '44 by city; previously supplied by Co. SUPPLY.—Springs, artesian wells, and mountain stream, by gravity. In '91 new supply was projected. Makers rept. 250,000-gall. Worthington simple high pressure. RESERVOIR.—Cap., 1,900,000 galls.; one mile from city and 75 ft. above it. Press repts. state 6,000,000-gall. reservoir was constructed in '93 or '94. DISTRIBUTION.—(In '88.) Mains, 10 miles. Meters, 1. FINANCIAL.—Cost (in '88), $125,000. NOTE.—No rept. since '89. REFERENCE.—Eng. News, Aug. 5, '82.

14, 15. **FROSTBURG,** Allegany Co. (3,804.)

FROSTBURG WATER CO.

Built in '54. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Springs and artesian wells, by gravity from collecting reservoir, with tank for fire protection. RESERVOIR.—Cap., about 4,000,000 galls. DISTRIBUTION.—Mains, 4.5 miles. Taps, 315. Meters, 0. Hydrants, 33. CONSUMPTION.—(Galls.) av., 30,000. FINANCIAL.—Cost, $27,500. Cap. Stock: Authorized, $40,000; all paid-up. Revenue used in extensions. Debt, $4,400; floating, $1,600; bonded, $2,800, at 6%. Expenses, $759: Operating, $450; int., $223; taxes, $86. Revenue, $2,463: Consumers, unmetered, $2,312; City, $150. NOTE.—No official rept. since '90-1 Manual. Feb., '97, J. N. Benson rept. Co. still in operation and that Hazlehurst Sprigg, Cumberland (Secy. in '90) should be addressed for information. REFENENCE.—Eng. News, Dec. 30, '82.

CITY PLANT.

Built in '90-1 by city. SUPPLY.—Surface water, by gravity. RESERVOIRS.—Supply for 60 days. DISTRIBUTION.—Mains, 6 miles. Taps, 250. Hydrants, about 10. FI-

NANCIAL.—Cost, $45,000. Debt, Bonded, $40,000, at 6 and 4½%. Revenue: Consumers, $1,200. Rept. in '92.

16. **HAGERSTOWN,** Washington Co. (10,118.) Built in '81-2 by Washington County Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are subject to approval by city. Press repts. latter part of '96 stated that supplementary hydrant contract had been made; city to pay $45 each for one hydrant to each 500 ft. of extensions ordered by city; previously $1,000 per yr. covered all hydrants. LEGAL DIFFICULTIES.—Press repts. state that in '92 court decided Co. could not be compelled, under its contract, to lay mains outside corporate limits as they existed when contract was made. SUPPLY.—Mountain springs, by gravity to storage reservoir, and well by pumping. PUMPS.—Cap., 1,000,000 galls.; Smith-Vaile. Bituminous coal used; av. cost, $2.65 per short ton. RESERVOIRS.—Cap., 20,000,000 galls.; area, 60 acres; 240 ft. above center of town. Supply main (in '89), 7¾ miles 12-in. c. i. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 20 miles; cost extensions met by earnings. Taps, 1,650; made by Co. for $5. Services, 1-in. galv. i.; paid for by property owner. Meters: 186; owned, controlled and repaired by Co.; yearly rental, $2. Use of meters compulsory for manufacturers and hotels. Co. cannot compel use of meters and consumers may not have them. Hydrants, public, 84; private, 6. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $122,685. Cap. Stock: Authorized, $80,000. Bonded debt, $40,000, at 4%. Expenses: Operating, $4,600; int., $1,600; taxes, $1,065. Revenue: Consumers, metered, $6,700; City, fire protection, $1,000; other purposes, $8,000. MANAGEMENT.—Prest., E. W. Mealey; Secy., Wm. H. Armstrong. Rept. by Treas. and Supt., Albert Heard, Nov. 13, '96. SEWERS.—None. REFERENCE. Eng. News, Feb. 23, '84.

17. **HAVRE DE GRACE,** Harford Co. (3,244.) Built in '83-4 by Havre de Grace Water Co. SUPPLY.—Susquehanna River, pumping to reservoir. PUMPS.—Cap., 360,000 galls.; Davidson. RESERVOIR.—Cap., 4,000,000 galls.; area, 1½ acres; 250 ft. above pumps and 210 ft. above town. DISTRIBUTION.—Mains, 2 miles. Taps, 130. Meters, 2. Hydrants, public, 32. FINANCIAL.—Cost, $20,000. Debt, $15,000, at 6%. Expenses, $2,000: Operating, $1,100; int., $900. Revenue, $2,200: Consumers, $1,700; City, $500. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, May 10, '84.

18. **LONACOMING,** Allegany Co. (3,897.) Built in '95 by Lonacoming Water Co.; put in operation Nov. 20, '95. Engr. and Contr., Jacob Schineller, Pittsburg, Pa. FRANCHISE.—35 yrs. from '95; provides for purchase of works by city at any time after 20 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $33.33 per yr. for each fire hydrant. No legal difficulties. SUPPLY.—Springs, by gravity from impounding reservoir. RESERVOIR.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Jan. 13. DISTRIBUTION.—Mains, 4 miles; cost extensions met by issue of bonds. Taps, 275; made by Co. for 25 cts. per tap. Services paid for by consumer. Meters: 4; owned and repairs paid by consumer; controlled by Co. Co. cannot compel the use of meters and a consumer may only have one by consent of the Co. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $26,000. Cap. Stock: Authorized, $70,000; all paid-up. Debt, $27,400: Floating, $1,400; bonded, $26,000, at 6%; due 1915; $9,000 additional bonds authorized. Expenses: Operating, $636; int., $1,560; taxes, $188. Revenue: City, fire protection, $1,100; other purposes, $1,900. MANAGEMENT.—Prest., D. M. Evans; Secy. and Treas., Hugh Scott; Supt., P. Sinclair. Rept. by Secy., Sept. 5, '96. SEWERS.—Has sanitary and partial storm sewers.

19. **MECHANICSTOWN** (P. O. Thurmont), Frederick Co. (930.) Built in '87 by Mechanicstown Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Mountain springs, by gravity from impounding reservoir. RESERVOIR.—Cap., 300,000 galls. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 3 miles. Taps made by Co. Services, ½-in. galv. i.; paid for by consumer. Meters, 0. Co. cannot compel the use of meters and consumers may not have them. Hydrants, public, 18. PRESSURE.—Ordinary, 82 lbs. FINANCIAL.—Cost, $10,000. Cap. Stock: Authorized, $10,000; all paid-up; paid 6% div'd in '95. Debt, floating, none. Sinking Fund, $500. Expenses: Operating, $150. MANAGEMENT.—Prest., Van B. Osler; Treas., Geo. W. Stocksdale. Rept. by Secy. and Supt., S. M. Birely, June 6, '96. SEWERS.—Has storm sewers only.

20. **MIDDLETOWN,** Frederick Co. (667.) Built in '93 by town; put in operation Nov. 1. Engr., M. P. Paret; Contr., Owen Patterson, both of Baltimore. No legal difficulties. SUPPLY.—Mountain spring, by gravity to and from reservoir. Spring 1½ miles from reservoir. RESERVOIR.—Cap., 650,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by tax. Taps, 60; made by town for 50 cents. Services, ¾-in. galv. i.; paid for by owner. No meters. Use of meters optional with consumer. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 3,000; max., 3,500; min., 2,000. PRESSURE.—Ordinary, 185 lbs.; fire, 214 lbs. FINANCIAL.—Cost, $14,500. Debt, $12,900, at 5%. Sinking Fund: $600, invested at 5%. Expenses: Operating, $50. Revenue: Consumers, none; misc., $312. Deficits met by taxation. MANAGEMENT.—Jno. E. Crone, Burgess; Secy., C. E. Wiemeyer; Supt., C. E. Wise. Rept. by Registrar, C. E. Wiemeyer, July 15, '96. SEWERS.—None.

P 4. **MOUNTAIN LAKE PARK,** Garrett Co. (118.) Combined water and lighting plant projected. Supply, creek, pumping to reservoir. Rept. by Engr., Alex. Potter, 137 Broadway, N. Y. City, Jan. 22, '97.

D 1. **MOUNT WASHINGTON,** Baltimore Co. (?). (Est., 1,400.) Built by Edw. L. Gernand. Supply, artesian wells, pumping to tank. Pump, Stilwell-Bierce & Smith-Vaile. Taps, 40. Meters, 36. Rept. by owner, Jan. 19, '97. No sewers.

D 2. **PERRYVILLE,** Cecil Co. (344.) Built in '93 by Perryville Water Co.; put in operation about June 1. Engr., Robt. K. Martin, Baltimore. Apparently for domestic use, only. A number of Rys. were supplied in '96. Supply, Mill Creek, by gravity. Reservoir, elev. above town, 140 ft. (press rept). Cost, $18,000. Cap. Stock: Authorized, $18,000; paid-up (in '93), $11,000. Bonded debt (in '92), $4,000. (Press rept. of election, May, '94.) Prest., H. Arthur Stump; Secy. and Treas., Jas. T. Graham. Information from unsigned rept. and press repts.

P 5. **POCOMOKE CITY,** Worcester Co. (1,866.) City hopes to build in '97. Legislative authority was secured in '96 and $25,000 bonds voted by people. Statute proved defective and new act must be secured. Rept. by R. M. Stevenson, Chf. Fire Dept., Dec. 23, '97.

21. **PORT DEPOSIT,** Cecil Co. (1,908.) Built by Port Deposit Water Co.; put in operation Jan. 1, '97. Engr., M. M. Dreibelbis, Hamburg, Pa. No Contr. FRANCHISE.—10 yrs from '97. SUPPLY.—Mountain springs, by gravity. RESERVOIR.—Cap., 300,000 galls.; distributing, on mountain, 1,861 ft. from main street. DISTRIBUTION.—Mains, 2 miles. Taps, made by Co. free during a limited time, including service to curb. Expect from 100 to 150 consumers. Services, galv. i. Hydrants, public, 16. PRESSURE.—65 lbs. Steam fire engines are used. FINANCIAL.—Cost, $20,000. Revenue: City, fire protection, $400. MANAGEMENT.—Prest., W. B. Meetch, Millersburg, Pa.; Supt., J. M. Johnson. Rept. by Secy. and Treas., H. G. Frederick, Millersburg, Pa., Dec. 7, '96. SEWERS.—None.

22. **PRINCESS ANNE,** Somerset Co. (865.) Built in '95 by town; tested in Dec. Contr., Chas. S. York, Chestertown. SUPPLY.—Well, 20 × 26 ft., pumping to tank. PUMPS.—Cap., 200,000 galls.; driven by 5-HP. Otto gas engine (rept. by makers of engine). TANK.—Cap., 45,000 galls.; elevated. DISTRIBUTION.—Mains, 2 miles. Hydrants, 15. Information from press repts.

23. **ROCKVILLE,** Montgomery Co. (1,568.) Contract for water and light plant let by town Jan. 20, '97, to Standard Boiler & Bridge Co., Bellaire, O., at $16,888; construction to be started by Feb. 15, and works to be ready for operation, May 15, '97. Engr., Geo. Cadogan Morgan, New York Life Building, Chicago. SUPPLY.—225-ft. well (already bored), pumping to stand-pipe. A deep-well pump, 75-HP. engine, steel tank on brick tower and 28 hydrants were proposed in Dec., 96. FINANCIAL.—Est. cost, $20,000. Bonds sold Dec., '96: $20,000, at 4%; 20-yr. MANAGEMENT.—Repts. by Clk., Jno. L. Brunett, Nov. 5, and Mayor, Jos. Reading, Dec. 24, '96.

24. **ROLAND PARK** (P. O. Station L, Baltimore), Baltimore City Co. (Not given.) Built in '93 by Roland Park Co.; put in operation Feb. 7, '93. Engr., Robert K. Martin, Baltimore. FRANCHISE.—Unlimited. Rates are not fixed in franchise nor subject to regulation by city in any way. LEGAL DIFFICULTIES.—"In dedicating the streets." SUPPLY.—Springs and wells. PUMPS.—Cap., 64,000 galls. Goulds, triple plunger pump, driven by electric motor; current from street railway circuit. STAND-PIPE.—Cap., 165,000 galls.; steel; 20 × 70 ft. Contrs., Riter & Conley, Pittsburg. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 3 miles; cost extensions met by cash. Taps, 83; made by Co., free. Services, ¾-in. galv. i.; paid for by consumer from main to meter. Meters: 83; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for all consumers. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 37,000; max., 45,000; min., 35,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $30,593. There is no separate corporation controlling the water-works, which are part of the assets of Roland Park Co. Expenses: Operating, $1,339; no int. or taxes. Revenue: Consumers, unmetered, $162, used by builders; metered, $1,591; City, none. MANAGEMENT.—Prest., Arthur Young, Chicago, Ill.; Secy. and Treas., R. W. Marchant, Jr.; Supt., S. O. Larkin. Rept. by Vice-Prest. and Genl. Mgr., Edward H. Bouton, July 29, '96. SEWERS.—Has sanitary sewers.

25. **SALISBURY,** Wicomico Co. (2,905.) Built in '88 by Salisbury Water Co. No legal difficulties. SUPPLY.—17 6-in. wells for domestic use, and Wicomico River for fire protection, pumping to stand-pipe and direct. PUMPS.—Deane and 650,000-gall. Hughes comp. dup. Bituminous coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 84,600 galls.; iron, 12 × 100 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 6 miles. Taps, made by Co. for $5, including service to curb. Services, lead and galv. i.; paid for by owner from curb. Meters: 3; owned and repaired both by Co. and consumer; controlled by Co.; yearly rental, 10% of cost. Use of meters optional with consumer, except compulsory for large consumers. Hydrants, public, 15; private, 11. CONSUMPTION.—(Galls.) av., 500,000; max., 700,000. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $50,000; paid-up, $8,500. Debt, $15,700: Floating, $700, at 6%; Bonded, $15,000, at 5%; due 1920. No deficits. MANAGEMENT.—Prest., Wm. H. Jackson; Ch. Pump. Engr., Fred. Bell.

Rept. by Secy. and Supt., Dr. L. S. Bell, July 30, '96. PROJECTED IMPROVEMENTS.—750,000-gall. Barr pump; boiler and wells. SEWERS.—Has sanitary and storm sewers.

26. **SNOW HILL,** Worcester Co. (1,483.) Under construction in '97 by town. Contract let Dec. 2, '96, to Crook, Horner & Co., Baltimore; to be completed Apr. 1, '97. SUPPLY.—Wells, pumping to stand-pipe. PUMP.—Cap., 600,000 galls.; Snow. Hydrants, 40. FINANCIAL.—Cost, est., $18,000. MANAGEMENT.—Information from E. S. Dashiell, Secy. Cy. Council, and from press repts.

P 6. **TANEYTOWN,** Carroll Co. (566.) Town voted $12,000 bonds for works May, '96, but finds works will cost $16,000 and has no authority to raise additional $4,000. Engr., Harvey Linton, Altoona. Supply, springs, by pumping. Address Geo. T. Motter, Town Comr. Latest rept., unsigned, Jan. 30, '97.

19. **THURMONT,** Frederick Co. (Est., 930.) See Mechanicstown.

27. **TOWSON,** Baltimore Co. (459.) Built in or since '94 by Towson Water Co., for general supply. SUPPLY.—Artesian well, pumping to stand-pipe. STAND-PIPE —Cap., 180,000 galls. (press rept.). MANAGEMENT.—Secy., J. E. Green. Unsigned rept., Nov. 6, '96.

28. **UNION BRIDGE,** Carroll Co. (743.) Built in '86-7 by Union Bridge Water Co. FRANCHISE.—Provides for purchase of works by city at any time at actual cost and 6% int. on investment. Rates are not fixed in franchise nor subject to regulation by city. No legal difficulties. SUPPLY.—Springs and well, pumping to reservoir. PUMPS. —Cap., 250,000 galls. (press rept.); Worthington comp. Cumberland coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 450,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Taps, 120; made by consumer for $1.50. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 30,000. FINANCIAL.—Cost, $18,000. Cap. Stock: Authorized, $1,179; all paid-up; paid no div'd in '95. Bonded debt, $6,000, at 6%. Expenses: Operating, $350; int., $360; taxes, $10. MANAGEMENT.—Prest., John Hartsock; Secy., John S. Repp; Treas., Jacob Stoner; Supt., John M. Hallenberger. Rept. by Prest., Oct. 12, '96. SEWERS.—None.

29. **WESTMINSTER,** Carroll Co. (2,903.) Built in '83 by Westminster Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. Contract requires city to levy a tax of 5 cts. per $100 of assessable property for use of water for fire protection. Contract only expires by mutual agreement. No legal difficulties. SUPPLY.—Springs, pumped from collecting to distributing reservoirs. PUMPS.—Cap., 950,000 galls.; 450,000 Worthington comp. non-cond. and 500,000 Blake. Bituminous coal used; av. cost, $2.90 per short ton. RESERVOIRS.—Cap., 1,100,000 galls.: Collecting, 100,000; distributing, 1,000,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5¾ miles; cost extensions met by earnings. Taps, 400; made by consumer. Services, galv. i.; paid for by consumer. Meters: 33; owned by Co. or consumer; controlled by Co.; repairs paid by owner of meter; yearly rental, none. Use of meters optional with Co.; compulsory for hotels and manufacturers. Hydrants, public, 46; private, 2. CONSUMPTION.—(Galls.) av., 100,000; max., 150,000; min., 75,000. PRESSURE.—Ordinary, 25 to 80 lbs.; fire, 55 to 110 lbs. FINANCIAL.—Cost, $55,000. Cap. Stock, $25,000: Common, authorized, $20,000; all paid-up; paid no div'd in '95. Pref'd, authorized, $5,000; all paid-up; 7% div'd guaranteed. Debt, $20,000: Floating, none; bonded, $20,000, at 6%; due 1913; were being called in at time of rept. and were to be floated at 5%. No sinking fund. Expenses, $4,020: Operating, $1,625; int., $2,200; taxes, $195. Revenue, $5,600: Consumers, unmetered, $4,000; metered, $600; City, fire protection, $1,000. MANAGEMENT.—Prest., Geo. W. Albaugh; Supt. and Ch. Pump. Engr., F. A. Myers. Rept. by Secy. and Treas., A. H. Huber, June 8, '96. SEWERS.—None. REFERENCE. Eng. News, May 17, '84.

DISTRICT OF COLUMBIA.

P 1. **TAKOMA PARK.** (Est., 190.) Projected by town. Supply, deep wells or Sligo Creek, pumping to stand-pipe. Rept. by Geo. A. Warren, Treas., June, '96. Press rept. Feb. 4, '96, stated that subject was being investigated by Councilmen Geo. A. Warren, W. G. Platt and H. J. Long, and that this Com. had been authorized to employ an Engr.

1. **WASHINGTON AND GEORGETOWN,** (Washington, 188,932; Georgetown, 14,046.) Built in '53-9 by U. S. Government; District of Columbia owns and controls distribution system; one-half of cost of extensions of supply system is paid by U. S. and one-half by the District. SUPPLY.—Potomac River, by gravity, with about 10% pumped to high service. A masonry dam 2,877 ft. long extends across river at point of intake. AQUEDUCT.—Masonry, 9 ft. in diam., about 11 miles long, with fall of 0.791 ft. per mile. Carried across two valleys on masonry arches, Cabin John Bridge having a single span of 220 ft. PUMPS.—Cap., 15,500,000 galls.: Holly hor. high duty, 2,500,000; Nordberg hor. trip. exp., 5,000,000; Barr vert. trip. exp. (under erection), 8,000,000. (Makers rept. 500,000 Barr for high service.) Bituminous coal used; av. cost, $2.95 per short ton. RES-

SERVOIRS.—Cap., 330,500,000 galls. Receiving: 176,000,000; on aqueduct, about 9 miles from dam. Distributing: 150,000,000; two miles below receiving reservoir, at lower end of aqueduct, with flow line 146 ft. above tide. High service: 4,500,000 galls.; 220 ft. above tide. NEW AQUEDUCT AND RESERVOIR.—Not in use. A 300,000,000-gall. reservoir has been built, about 20,715 ft. from the old distributing reservoir and a tunnel nearly completed to connect the two. Construction of tunnel was stopped in '88, owing to alleged faulty construction. In '96 Maj. W. L. Marshall, Capt. Jas. L. Lusk, A. Fteley and Desmond Fits Gerald rept. in favor of completing tunnel. Tunnel was to have had cross-sectional area of 76.34 sq. ft. for lined, and 82½ sq. ft. for unlined. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 331.9 miles; cost extensions met by tax of $1.25 per front ft. of abutting property, levied but once, any deficiency made up from other revenues. Taps, 45,227; made by District for $3. Services, lead or c. i.; paid for by property owner. Meters: 695; owned and repaired by consumer; controlled by District. Use of meters optional with consumer; compulsory for hotels, livery stables, manufacturing purposes and all large consumers. Hydrants, public, 1,757. CONSUMPTION.—(Galls.) av., 44,000,000; max., 50,000,000. Very free use of water at government buildings. Steam fire engines are used. FINANCIAL.—Cost, $9,700,000: Supply system, $8,500,000; distributing system, $1,200,000. Debt, $683,000: Floating, $350,000, at 4%, due to U. S.; bonded, $343,000, at 7%; due 1901-5. Expenses, operating, $88,287: Supply, $34,000; distributing, $54,287; int. and sinking fund, $104,-068. Revenue: Consumers, unmetered, $234,843; taxes, taps, etc., $32,885; metered, $20,596. Distrbution system is self supporting and pays one-half the cost of extension of supply system. In last two years $600,000 of surplus general revenues has been transferred for part payment of debt due to U. S. for half cost of extensions of supply system. MANAGEMENT.—Supt., W. A. McFarland; Ch. Pump. Engr., H. F. Hayden. Rept. Nov. 4, '96, by Edw. Burr, Capt. of Engrs., U. S. Army, Asst. to Engr. Comr., D. C., in charge of the Water Department. PROJECTED IMPROVEMENTS.—Increase of supply has been projected for several years. Reservoir supply is ample, but mains lack capacity. Est. cost of completing work already begun, but suspended, $1,000,000. Consists of a 300,000,000-gall. reservoir with connections and a masonry conduit between new and old reservoirs. Work is about two-thirds completed. See above. SEWERS.—Has sanitary and open storm sewers. REFERENCES.—Eng. News, Apr. 30, '81; Cabin John arch, June 25, '87, illus.; 48-in. pipes, Feb. 13, '92, illus.; cost of pipe laying, Jan. 10, '95.

GROUP III.—SOUTH ATLANTIC STATES.

Water-Works Completed, in Process of Construction or Projected, in Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

VIRGINIA.

1. **ABINGDON,** Washington Co. (1,674.) Built in '89-90 by Abingdon Water-Works Co. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles. Taps, 42. Meters, 0. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 30,000. FINANCIAL.—Cost, $18,000. Cap. Stock: Authorized, $25,000, including electric lighting plant; paid 6% div'd in '95. Debt, $750. Expenses, $45. MANAGEMENT.—Prest., T. P. Trigg; Secy. and Treas., T. B. Hurt; Supt., W. C. Click. NOTE.—Above figures, except, financial, are from '90-1 Manual.

2. **ALEXANDRIA,** Alexandria Co. (14,339.) Built in '51 by Alexandria Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. SUPPLY.—Cameron's Run, pumping to reservoir. PUMPS.—Originally 20-ft. water-wheel, operating double-acting pump. In '55 steam pump was added. RESERVOIRS.—Cap., est., 11,000,000 galls.; 3,000,000 and 8,000,000. DISTRIBUTION.—(In '81.) Mains, 15.9 miles. Taps, 573. Hydrants, public, 147. FINANCIAL.—(In '79.) Expenses, $4,241. Revenue: $14,631. NOTE.—No rept. since '81. REFERENCE.—Eng. News, Aug. 6, '81.

D 1. **BASIC CITY,** Augusta Co. (Not given.) Built in '90-1 by Basic City Mfg. & Land Co. Supply, spring, pumping to 300,000-gall. reservoir. Pumps, cap., 1,000,000 galls.; Deane. Mains, 1¼ miles. NOTE.—No rept. since '90-1 Manual.

3. **BEDFORD CITY,** Bedford Co. (2,897.) Built in '85 by town. SUPPLY.—Spring, by gravity. Oct., '94, J. M. Daniel, Recorder, rept. that $20,000 had been appropriated for increasing supply. DISTRIBUTION.—(In '88.) Mains, 12 miles. Taps, 350. Meters, 0. Hydrants, public, 32. FINANCIAL.—(In '88.) Cost, $45,000. Bonded debt, $42,400, at 6%. Expenses, $500. Revenue: Consumers, $3,200. NOTE.—No official rept. since '90-1 Manual.

4. **BERKLEY,** Norfolk Co. (3,899.) Built in '94 by Berkley & South Norwalk Water & Electric Light Co.; put in operation in Jan. Engrs. and Contrs., American Pipe Mfg. Co., Phila., Pa. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—One Deane dup. and one Snow dup. STAND-PIPE.—Cap., 367,200 galls.; iron, 25 × 100 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles; w. i. and cement pipe. Taps, 188. Services, iron and lead; paid for by consumer. Meters: 20; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 52. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. W. Hawley; Secy., H. Bayard Hodge, Phila., Pa.; Treas., N. B. Cox; Supt., Chas. Bliven. Rept. by American Pipe Mfg. Co., June 8, '96.

P 1. **BERRYVILLE,** Clarke Co. (1,215.) Berryville Water Co. laid 4 out of 7 miles of supply main from springs to town, including 650 ft. of submerged pipe beneath Shenandoah River; Const. Engr., Jas. P. Herdic, Williamstown, Pa. Co. also bought 100 acres of land at springs and right of way, expending about $28,000. Rept. by Engr.,

Dec. 22, '91, and Prest., Geo. C. Thomas, Feb., '94. July 6, '94, property was sold (advertised to be) at auction under court decree for Mercantile Trust & Deposit Co., of Baltimore, Trustee. Aug., '96, Mr. Thomas rept. nothing further had been done. Oct. 4, '96, press rept. stated 60-day option on property had been secured by O. W. Gardner and S. C. Callahan, Hollidaysburg, and that works would be built if satisfactory arrangements with town authorities could be made.

5. **BIG STONE GAP,** Wise Co. (896.) Now owned by Glamorgan Co., Contrs. for the works, who acquired the plant by the failure of the Water Co. to meet their obligations; works were bid in at $20,000. Built in '90-1 by Big Stone Gap Water Co.; put in operation June 1. No legal difficulties. SUPPLY.—Powell's River, by gravity to reservoir. RESERVOIR.—Cap., 3,500,000 galls. DISTRIBUTION.—Mains, 15 miles. Taps, 125; made by Co. Services, galv. i.; paid for by owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 36. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 lbs.; fire, 180 lbs. FINANCIAL.—Cost, $80,000. Revenue, City, fire protection, $600. MANAGEMENT.—Glamorgan Co., Lynchburg; Supt., J. L. Jennings. SEWERS.—Has sanitary sewers.

6. **BRISTOL,** Washington Co. (2,902.) Built in '89 by Co. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (in '89), 7 miles. Taps, 200. Meters, 0. Hydrants (in '89), 40. FINANCIAL.—Cost, $33,000. Bonded debt, $33,000, at 6%. Expenses, $2,290: Operating, $300; int., $1,990; taxes, none. Revenue, $1,900: Consumers, $1,000; City, fire protection, none; other purposes, $900. NOTE.—No rept. since '90-1 Manual.

— ? **BUCHANAN,** Botetourt Co. (802.) Built in '91 by Central Land Co. to aid in development of town. Rept. in '96 that works were not in operation.

7. **BUENA VISTA,** Rockbridge Co. (1,044.) Built in '90 by town. SUPPLY.—Mountain streams, by gravity. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Taps, 95. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—100 lbs. FINANCIAL.—Cost, $20,000. No debt. Revenue, about $2,000. MANAGEMENT.—C. Bargainn. NOTE.—No rept. since '90-1 Manual.

8. **CAPE CHARLES,** Northampton Co. (Est., 800.) Built in '96 by town; put in operation Aug. 15. Engr. and Contr., Chas. S. York, Baltimore, Md. SUPPLY.—Deep well and pool, pumping to tank. PUMPS.—Cap., 240,000 galls.; Rumsey triplex, driven by Otto gas engine. TANK.—Cap., 50,000 galls.; cypress, on steel tower. DISTRIBUTION.—Mains, 4 miles; cost extensions met by income. Taps, made by consumer. Services, galv. i.; paid for by owner. Use of meters compulsory for R. Rs. and factories. Town can compel use of meters and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—Ordinary, 50 lbs.; fire, 150 lbs. MANAGEMENT.—Prest., G. G. Savage; Ch. Pump. Engr., Chas. Savage. Rept. by Chas. R. York, Engr., Nov. 13, '96. SEWERS.—Will be built.

9. **CHARLOTTESVILLE.** Albemarle Co. (5,591.) Original plant built in '56 by University of Virginia and city jointly. Present works built in '86 by city. SUPPLY.—Springs and surface water, by gravity. RESERVOIRS.—Cap., 220,000,000 galls.; storage, located 6 miles from city, formed by a dam between two mountains. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 28 miles. Taps, 871; made by city, free, including service to curb line. Services, galv. i.; paid for by consumer. Meters, 8, owned and repaired by property owner; controlled by city. Use of meters compulsory for factories. City can compel use of meters and any consumer may have one. Hydrants, public, 67. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $160,000. Expenses, Operating, $2,400. Works are self-supporting. MANAGEMENT.—Pres., J. S. McCue, Mayor; City Treas., W. T. Jones. Rept. by Supt., Ellis F. Harris, June 5, '96. PROJECTED IMPROVEMENTS.—Surveys for additional supply were completed latter part of '96 by C. E. Dickinson, of Cobham. Masonry dam is proposed at head of Moormans River, in Blue Ridge Mts., and a 16-mile conduit. Rept. by Engr., in Oct. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Jan. 21, '82.

10. **CHATHAM.** Pittsylvania Co. (757.) Built in '88 by town. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 67,500 galls. DISTRIBUTION.—(In '88.) Mains, 2 miles. Taps, 4. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 1,000. FINANCIAL.—(In '88.) Cost, $7,000. Expenses, $25. MANAGEMENT.—Rept. by Supt., Chas. E. Holt, Oct., '96.

11. **CLIFTON FORGE,** Allegheny Co. (1,792.) Built in '88-90 by Clifton Forge Water Co. FRANCHISE.—Perpetual. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes, but receives compensation for public service. No legal difficulties. SUPPLY.—Smith's Creek, pumping to distributing reservoir. PUMPS.—Cap., 1,000,000 galls.; 500,000 Worthington simple high pressure, 500,000 Laidlaw-Dunn-Gordon water power. Red ash run of mine coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 300,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains (in '90), 3.8 miles; cost extensions met by water receipts. Taps, 310; made by Co., free. Services, ¾-in.; paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 22; private, 1. CONSUMPTION.—(Galls.) av., 200,000; max., 300,000; min., 175,000. PRESSURE.—Ordinary

and fire, 70 lbs. FINANCIAL.—Cost, $55,000. Cap. Stock, authorized, $45,000; all paid-up; paid no div'd in '96. Expenses: Operating, $2,500; taxes, $110. Revenue: Consumers, $3,000; City, fire protection, $400; street sprinkling, $100; other purposes, $100. MANAGEMENT.—Prest., J. J. Montague; Secy., C. E. Wellford, both of Richmond; Treas., W. C. Moody; Ch. Pump. Engr., T. C. Wood. Rept. by Supt., W. F. Tinsley, Aug. 18, '96. SEWERS.—Has sanitary and storm sewers.

12. **COVINGTON,** Alleghany Co. (704.) Built in '89 by Covington Water Co. FRANCHISE.—20 yrs. from '89; provides for purchase of works by city every 10 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is exempt from local taxes. City to pay $25 per yr. for first 10 hydrants, $15 for next five, and then $25 each. No legal difficulties. SUPPLY.—Mountain branch, by gravity, with pumping for a small portion of the year. PUMPS.—Cap., 360,000 galls.; Worthington. Red ash bituminous coal used; av. cost, $1.65 per short ton. RESERVOIR.—Cap., 300,000 galls.; distributing; 170 ft. above village. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5¼ miles; cost extensions met by earnings. Taps, 160; made by Co., free, including service to curb line. Services, l.; paid for by consumer from curb line. Meters, 3; owned, controlled and repaired by Co. Use of meters compulsory for manufacturers. Co. cannot compel use of meters. Hydrants, public, 14; private, 2. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 65 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $15,000. Cap. stock, authorized, $8,500; all paid-up; paid 20% div'd in '95. Expenses: Operating, $765; taxes, $313. Revenue: Consumers, unmetered, $1,848; City, fire protection, $265; other purposes, $400 (R. R.). MANAGEMENT.—Rept. by Prest. and Supt., E. M. Nettleton, June 6, '96. PROJECTED IMPROVEMENTS.—Increasing gravity supply.

13. **CREWE,** Nottoway Co. (887.) Now owned by Crewe Land & Improvement Co. Built in '88 by Virginia Water Co. SUPPLY.—Four springs, pumping to tank. PUMP.—Cap., 400,000 galls.; Gordon dup. TANKS.—Cap., 40,000 galls.; two 20,000. DISTRIBUTION.—Mains, 4 miles. Taps, 40. Meters, 1. Hydrants, 24. FINANCIAL.—Cost, $25,000. NOTE.—No rept. since '90-1 Manual.

14. **CULPEPER,** Culpeper Co. (1,620.) Built in '96 by town; put in operation Aug. 15. Engr., W. Nalle; Contrs., Luck & Palmer. SUPPLY.—Springs and streams, by gravity, to pumping station, thence pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Stillwell-Bierce and Smith-Vaile Co. STAND-PIPE.—Cap., 293,760 galls.; steel; 25 × 80 ft., on stone masonry foundation. DISTRIBUTION.—Mains, 7½ miles. Taps, made for $2.75. Services, galv. l.; paid for by property owner. Meters, 0. Hydrants, public, 44; private, 1. PRESSURE.—Ordinary, 92 lbs. FINANCIAL.—Cost, about $35,000. MANAGEMENT.—Mayor, S. Diener; Treas., G. W. Kurl. Rept. by Supt. and Ch. Pump. Engr., J. P. C. Peter, Sept. 4, '96. SEWERS.—None.

15. **DANVILLE,** Pittsylvania Co. (10,305.) Now owned by city. Built in '75 by Co.; purchased by city in '76, including gas works. SUPPLY.—Dan River, pumped to reservoir. PUMPS.—Two Worthington 1,000,000 simple high pressure; 1,500,000 comp. cond. Bituminous mine run coal used; av. cost, $3.56 per short ton. RESERVOIR.—Cap., 6,000,000 galls.; elev., 230 ft. FISCAL YEAR CLOSED Dec. 30, '95. DISTRIBUTION.—Mains, cost extensions met by tax levy or bonds. Taps, 974; made by city for $5. Services, lead; paid for by property owner. Meters, 971; owned, controlled and repaired by city. Yearly rental, none. Use of meters compulsory for all consumers; reduced consumption from 126 to 42 galls. per capita. Hydrants, public, 107. CONSUMPTION.—(Galls.) av., 509,817. Steam fire engines are used. FINANCIAL.—Deficits are all paid by general taxation. MANAGEMENT.—Water Committee of City Council; Secy. and Treas., Frank Talbott; City Engr. and Supt., C. A. Ballou; Ch. Pump. Engr., Saml. Smith. Rept. by Supt., June 8, '96. SEWERS.—Has sanitary sewers only.

16. **ELKTON,** Rockingham Co. (Est. 138.) Built in '91 by Elkton Lithia Water Co.; put in operation May 1. Engr., A. C. Walker, Luray; Contrs., Blanford & Co., Bedford. FRANCHISE.—75 yrs. from '89. SUPPLY.—Springs, by gravity. FISCAL YEAR CLOSED April. 30. DISTRIBUTION.—Mains, 4 miles; cost extension met by Co. Taps, 69; made by consumer for $1. Services, l.; paid for by property owner. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $8,000. Cap. Stock: authorized, $26,000; all paid-up; paid 6½% div'd in '95. Expenses, Operating, $75. MANAGEMENT.—Secy., V. C. Miller. Rept. by Prest. and Treas., J. G. H. Miller, June 4, '96.

P 2. **FALLS CHURCH,** Fairfax Co. (792.) Projected by M. E. Church; legislative authority not secured. SUPPLY.—Springs, by gravity, or artesian wells, by pumping. Est. cost, $25,000; capital not secured. Rept. by M. E. Church, June 24, '96.

17. **FARMVILLE,** Prince Edward Co. (2,404.) Built in '94 by Farmville Water, Light, Heat & Power Co.; put in operation in Oct. Engr., J. C. Rawn, Roanoke. Work done by Co. FRANCHISE.—15 yrs. from '94. No legal difficulties. SUPPLY.—Buffalo Creek, through filter crib, pumping to stand-pipe. PUMPS.—Cap., 800,000 galls.; 2—400,000 Smith-Vaile comp. non-cond. Bituminous Pocahontas coal used; av. cost, $2.80 per short ton. STAND-PIPE.—Cap., 150,000 galls.; steel, 25 × 50 ft. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 4.2 miles. Taps, 90. Services, galv. l.; paid for by consumer. Meters, 20; owned by consumer; controlled and repaired by Co. Use of meters compulsory for factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 20; private, 2. CONSUMPTION.—(Galls.) av.,

80,000; max., 100,000; min., 60,000. FINANCIAL.—Cost, $35,565. Cap. Stock: Authorized, $40,000; all paid-up; paid no div'd in '95. No debt. Expenses: Operating, $1,450; taxes, $90. Revenue: City, fire protection, $400; street sprinkling, $240. MANAGEMENT.—Prest., J. P. Andre Mottu; Secy. and Treas., Etienne Muller, both of Norfolk. Supt., L. H. Corley; Ch. Pump. Engr., R. L. Dugger. Rept. by Co., Sept. 7, '96. SEWERS.—None.

18, D 2. **FREDERICKSBURG,** Spottsylvania Co. (4,528.)

CITY'S SYSTEM.

SUPPLY.—Rappahannock River, pumping to reservoir. PUMPS.—Cap., 450,000 galls.; Blake dup. RESERVOIRS.—Cap., 8,500,000 galls.: Storage, 4,500,000; distributing, 4,000,000 galls.; elev., 125 ft. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by general fund. Taps, 1,025; made by city, free, including service to curb. Services, lead and iron; paid for by consumer, from curb. Meters, 19; owned, controlled and repaired by city. Use of meters optional with city; compulsory for motors and engines. Hydrants, public, 56. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 56 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $35,000. Bonded debt, $30,000, at 5%. MANAGEMENT.—Prest., E. D. Cole. Rept. by Secy. and Supt., S. J. Quinn, June 5, '96. SEWERS.—None.

FREDERICKSBURG AQUEDUCT CO.

Built in '32 after plans by Alex. Henderson. Supply, Poplar Springs, 1½ miles from town, by gravity. In '82 there were 4 miles of mains and 225 taps, and works had cost $25,000. REFERENCE.—Eng. News, Nov. 11, '82.

19. **FRONT ROYAL,** Warren Co. (868.) Built in '91 by Royal Water Co.; put in operation in Aug.. Engr. and Contr., D. G. Adelsberger, Baltimore, Md. FRANCHISE.—Provides for purchase of works by city after 20 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Springs in Blue Ridge Mts., by gravity; elevation, 260 ft. RESERVOIR.—Cap., 500,000 galls.; impounding. DISTRIBUTION.—Taps, 127; made by Co., free. Services, galv. i. Meters, 0. Hydrants, public, 25. PRESSURE.—Ordinary, 120 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $27,500. Cap. Stock: Authorized, $10,000; all paid-up. Bonded debt, $17,500, at 6%; due 1902. Expenses, Operating, nominal. Revenue, City, fire protection, $750. MANAGEMENT.—Secy. and Treas., W. P. King. Rept. by H. L. Cook, Prest. and Supt., June 22, '96. PROJECTED IMPROVEMENTS.—Extensions of 10,000 ft. 4-in.; 3,500 ft. 2-in. pipe. SEWERS.—None.

20. **GATE CITY,** Scott Co. (Est., 750.) Built in '88-9 by Estillville Water Co. FRANCHISE.—25 yrs. City to pay $9 per hydrant per yr. SUPPLY.—Impounding reservoirs, by gravity. RESERVOIR.—Cap., 100,000 galls.; impounding. DISTRIBUTION.—Mains, 2 miles. Taps, 40. Hydrants, public 60. FINANCIAL.—Cost, $1,500. No debt. Expenses, $50. MANAGEMENT.—Prest. and Supt., J. S. Greever. Rept. by Secy. and Treas., R. F. McConnell, Oct. 6, '96.

21. **GLASGOW,** Rockbridge Co. (Not given.) Now owned by W. G. Mathews & Co. Built in '90 by Rockbridge Co. Co. is exempt from local taxes. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 3,000,000 galls. DISTRIBUTION.—Services, i.; paid for by owner. Meters, 0. Hydrants, public, 8. FINANCIAL.—Cost, $15,000. No floating debt. MANAGEMENT.—Rept. by Supt., W. G. Mathews.

2. Tenn. **GOODSON,** (P. O. Bristol, Tenn.) Washington Co. (Not given.) Supply from Bristol, Tenn.

22. **GORDONSVILLE,** Orange Co. (962.) Built in '89 by town. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 750,000 galls. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 2 miles; cost extensions met by private owners. Taps, made by town, free. Services, galv. i.; paid for by owner. Town can compel use of meters and any consumer may have one. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Bonded debt, $12,000. Expenses: Operating, $240. Deficits are met by taxation. MANAGEMENT.—Prest., G. M. Walkins; Secy., T. W. Ross; Treas., J. L. Sneed. Rept. by Supt., W. H. Porter, July 18, '96. SEWERS.—Has storm sewers only.

— ? **GOSHEN** (P.O., Goshen Bridge), Rockbridge Co. (Not given.) Press rept., June, '92, stated construction of works had been resumed. No response to repeated inquiries.

— ? **HAMPTON,** Elizabeth City Co. (2,513.) In '91 H. R. Booker, Secy. Hampton Water Co., reported that works had suspended operations and Co. was searching for a better water supply. Works were built to supply National Soldiers' Home, and in hopes of supplying Chesapeake City and hotels at Old Point Comfort. Press rept., Mar., '94, stated Hampton Artesian Water Co. had been incorp.

23. **HARRISONBURGH,** Rockingham Co. (2,792.) Built in '88-9 by town. SUPPLY.—Artesian well, pumping to reservoir. Dec. 9, '96, N. Wilson Davis, Atlanta, Ga., rept. he was making surveys for gravity supply. PUMP.—Cap., 144,000 galls.; Knowles. Coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 1,200,000 galls.; storage and distributing. FISCAL YEAR CLOSED July 31. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by taxation. Taps, 200; made by consumer for $1. Services, galv. i.; paid for by consumer. Meters, 8; owned, controlled and repaired by consumer. Use of meters optional with consumer; compulsory for manufacturers. Hydrants, public, 36.

PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $25,000. Expenses, operating, $1,750. Revenue, $1,686. MANAGEMENT.—Treas., D. S. Lewis. Rept. by Supt., W. H. Bowman, Aug. 5, '96. SEWERS.—None.

45. **JEFFERSONVILLE** (P. O., Tazewell), Tazewell Co. (604.) Supply from Tazewell.

D 8. **LEESBURG**, Loudoun Co. (1,650.) Built in '45 by village. Supply, Rock spring, by gravity. Mains, 4 miles. Cost, $20,000. No debt. Expenses, $250. Revenue, $300. No rept. since '90-1 Manual.

24. **LEXINGTON**, Rockbridge Co. (3,059.) Built in '33 by town. SUPPLY.—Springs, by gravity to and from receiving well and reservoir. RESERVOIR.—Cap., 2,500,000 galls. DISTRIBUTION.—Mains, 10 miles. Taps, 400. Meters, 3. Hydrants, 29. CONSUMPTION.—(Galls.) av., 75,000. FINANCIAL.—Cost, $38,600. Bonded debt, $37,500, at 6%. Expenses, $2,850: Operating, $600; int., $2,250. Revenue, consumers, $4,000. NOTE.—No rept. since '90-1 Manual.

25. **LYNCHBURG**, Campbell Co. (19,709.) Present works built in '28 by city; first supplied in 1799 by Co. SUPPLY.—James River, pumping to high and low service reservoirs. PUMPS.—Cap., 8,000,000 galls. Holly water power, 2,000,000; Deane comp. cond. dup., 2—2,000,000; Deane water power, 500,000; Stevenson, 1,500,000. Pocahontas mine run coal used; av. cost, $2.67 per short ton. RESERVOIRS.—Cap., 8,250,000 galls.; distributing, 4,500,000 and 3,750,000; iron water tower, 8 × 20 ft., in center of high service reservoir. FISCAL YEAR CLOSED Jan. 31, '96. DISTRIBUTION.—Mains, 30 miles; cost extensions met by annual appropriation. Taps, 3,000; made by city, free. Services, lead and galv. i.; paid for by city. Meters, 40; owned, controlled and repaired by city. Use of meters compulsory for manufacturers, foundries, bottling establishments and ice companies. Hydrants, public, 300; private, 50. CONSUMPTION.—(Galls.) av., 3,951,000; max., 4,500,000; min., 3,000,000. PRESSURE.—Ordinary and fire, 20 to 150 lbs. Steam fire engines are used. FINANCIAL.—Cost (est. value property), $402,654. Bonded debt, $229,200: $70,000, at 6%, due half each in 1904 and 1912; $159,200, at 5%, due $100,000 in 1915, $20,700 in 1916, and $38,500 in 1926; last two items subject to call and all 5% exempt from taxation. Expenses, operating, $7,488. Revenue: Street sprinkling, $100; public buildings, $4,500. Water used from which no revenue is derived, $12,000. MANAGEMENT.—Jas. G. Ryan; City Engr., S. P. Rades. Rept. by Supt., Nov. 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 17, '81.

26. **MANCHESTER**, Chesterfield Co. (9,246.) First supplied in '40 from works built by town which have since been abandoned. In '88-9 Wm. H. White & Bro., N. Y. City, built works, which were bought by city July 1, '94. SUPPLY.—James River, pumping to reservoir, with direct pumping in case of fire. PUMPS.—One 100,000-gall. water power. (Makers rept. 2—750,000 Worthington comp. non-cond.). RESERVOIR.—Cap., 400,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 9½ miles. Taps, 900. Meters, 8. Hydrants, public, 70. FINANCIAL.—Press rept., Dec., '92, gave cost of Co. works as $73,062. MANAGEMENT.—Clk., J. C. Jenks. Rept. by H. S. Bradley, ex-Supt., Nov. 3, '96. REFERENCE.—Eng. News, May 9, '85.

27. **MARION**, Smyth Co. (1,651.) Built in '88 by town. SUPPLY.—Springs, by gravity. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 4½ miles. Taps, 200; made by town. Services, w. i.; paid for by consumer. Hydrants, public, 13. FINANCIAL.—Cost, $15,000. Bonded debt, $9,000, at 6%, due 1908; $3,000, at 6%, due 1914. Expenses: Operating, $50; int., $720. Revenue, consumers, unmetered, $1,100. Interest is paid out of receipts for rentals and $500 to $1,000 in bonds are paid annually. MANAGEMENT.—Prest., A. H. Atkins, Mayor; Treas., John R. Sexton; Supt., L. F. Scherer. Rept. by Recorder, A. T. Lincoln, Sept. 25, '96. SEWERS.—None.

28. **MARTINSVILLE**, Henry Co. (Est., 1,850.) Built in '94 by town; put in operation in Aug. Engr., C. B. Bryant. Contrs., Va. Paving & Constn. Co. SUPPLY.—Creek, pumping to stand-pipe. PUMPS.—Stillwell-Bierce and Smith-Valle comp. dup. Bituminous Pocahontas coal used; av. cost, $4.25 per short ton. STAND-PIPE.—Cap., 200,000 galls.; iron, on masonry foundation. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by taxation. Taps, 216; made by town at owner's expense, who receives a credit of $3 on rental account. Services, galv. i.; paid for by owner. Co. cannot compel, but may prohibit use of meters. Hydrants, public, 31; private, 0. CONSUMPTION.—(Galls.) av., 50,000; max., 80,000. PRESSURE.—Ordinary, 70 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $30,000. Expenses: Operating, $790; int., $1,800. Revenue, consumers, unmetered, $1,900. Deficits are met by general taxation. MANAGEMENT.—Mayor, Saml. Morgan; Clk., A. S. Gromley; Treas., Jas. M. Smith; Supt., J. W. Cheshire; Ch. Pump. Engr., R. K. Cheshire. Rept. by Supt., Nov. 16, '96. SEWERS.—Has partial system of sanitary sewers.

29. **MAX MEADOWS**, Wythe Co. (Est., 175.) Built in '90-1 by Max Meadows Land & Improvement Co. SUPPLY.—Reed Creek, pumping to reservoir. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 4½ miles. Hydrants, 12. NOTE.—No rept. since '90-1 Manual.

30. **NEWPORT NEWS**, Warwick Co. (4,449.) Built in '92 by Co.; put in operation in Nov. Engrs., Robt. Van Buren and I. M. de Verona, Brooklyn. SUPPLY.—

Springs, from impounding reservoir, pumping to tank. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Davidson trip. expansion. New River bituminous coal used; av. cost, $2.54 per short ton. Cost of pumping 3½ cents per 1,000 galls. RESERVOIR.—Cap., 370,000,000 galls.; impounding. TANK.—Cap., 160,000 galls.; iron; 30 x 20 ft., on trestle 154 ft. high. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains: Cost extensions met by property owners. Taps, 1,200; made by Co. for $3. Services, lead to curb, balance galv. i.; paid for by property owner. Meters, 6; owned, controlled and repaired by Co. Co. cannot compel and may prohibit use of meters; it is compulsory for factories and large consumers. Hydrants, public, 155; private, 3. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 80 lbs. Five steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., C. B. Orcutt; Secy., F. H. Davis; Treas., I. E. Gates; Supt., L. B. Manville. Rept. Dec. 31, '96. SEWERS.—Has sanitary sewers.

31. **NORFOLK,** Norfolk Co. (34,871.) Built in '72 by city. SUPPLY.—First Moores' Bridges, Lakes Lawson and Bradford, pumping direct. Aerating Plant.—At Moore's Bridges; process controlled by New York Filter Mfg. Co. PUMPS.—(In '89.) Main station, 20,000,000 galls.: 5,000,000 Gaskill hor. high duty; 5,000,000 and 10,000,000 Worthington high duty. Lake Lawson station, 9,000,000 galls.: 2,000,000 and 5,000,000 Worthington; 2,000,000 Deane. Lake Bradford station: 2,000,000 Holly-Gaskill hor. rotative. (In '97 makers rept. 2—2,000,000 Worthington in addition.) FISCAL YEAR CLOSED June 30, '95. DISTRIBUTION.—Mains, 41 miles; cost extensions met by appropriations. Taps, 6,159; made by city for $5. Services, lead; paid for by owner. Meters, few; owned by consumer; controlled by city. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 169; private, 36. CONSUMPTION.—(Galls.) av., 3,500,000; max., 5,000,000; min., 3,000,000. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,000,000. Bonded debt, $700,000: $500,000, at 8%; due 1901; $200,000, at 5%. Sinking Fund, $25,500. Expenses: Operating, $36,741; int., $48,624. Revenue: Consumers, $105,363; City, none. Deficits are met by special water tax of 5 cts. per $100 on real and personal property. MANAGEMENT.—Prest., G. S. Bruce; Secy., J. W. Perry; Treas., J. H. Watters; Supt. (appointed since rept.), Jas. Riddle; Registrar, John R. Todd; Ch. Pump. Engr., Geo. W. Wright. Rept. by Reg., June 13, '96. PROJECTED IMPROVEMENTS.—Artesian wells being tested. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Aug. 20, '81.

32. **PETERSBURG.** Petersburg City Co. (22,680.) Built in '56 by city. SUPPLY.—Small brook, pumping from impounding to distributing reservoir. PUMPS.—Cap., 750,000 galls.; Guild & Garrison. (Makers rept. 2,000,000 Blake.) RESERVOIRS.—Cap. (previously rept.), 5,835,000 galls.: Impounding, 2,660,000; distributing, 2,675,000. Rept. of Com. in '93 stated that total reservoir cap. was about 30,000,000 galls. Press repts. in '93 stated 70,000,000 reservoir was under construction, with drainage area of 1,400 acres. Press repts. in '94-5 stated that high service reservoir was being built and would be put in use early in '95. Engr. for both new reservoirs, Jno. W. Hays, City Engr. DISTRIBUTION.—(In '87.) Mains, 11 miles. Taps, 1,080. Meters, 0. Hydrants, 110. PRESSURE.—Ordinary, 24 lbs.; fire, 60 lbs. FINANCIAL.—(In '87.) Cost, $150,000. Bonded debt, $125,000. Expenses, operating, $9,000. Revenue, $12,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 22, '82.

33. **POCAHONTAS,** Tazewell Co. (2,953.) Built about '93 by Pocahontas Light & Water Co. SUPPLY.—Pumped to tank. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington high pressure (rept. by makers). MANAGEMENT.—(In '94.) Prest., Logan M. Bullitt; Secy. and Treas., C. S. Thorne. Information from citizens and press repts.

34. **PORTSMOUTH,** Norfolk Co. (13,268.) Built in '83-8 by Portsmouth Water Co. No legal difficulties. SUPPLY.—Lake Kilby, pumping to stand-pipe and distributing reservoir. Force main, w. i., 19 miles long, and stand-pipe is located at pumping station. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Knowles. Coal used; av. cost, $2.85 per short ton. RESERVOIRS.—Cap., 1,000,000 galls. STAND-PIPE.—Cap., 528,770 galls.; steel, 30 x 100 ft., on concrete foundation. DISTRIBUTION.—Mains: Cost extensions met by cash. Taps, 1,953; made by Co. at from $3 to $6. Services, galv. i. and lead; paid for by consumer. Meters, 72; owned by Co. and consumer; controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydants, public, 115; private, 3. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 30 lbs.; fire, 40 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., John McNamee, Brooklyn, N. Y.; Secy. and Treas., C. D. Ward, N. Y. City. Rept. by Supt., G. H. Coleman, June 4, '96. PROJECTED IMPROVEMENTS.—New 20-in. cast-iron force main from Lake Kilby, 20 miles in length.

35. **PULASKI CITY,** Pulaski Co. (2,112.) Built in '91 by Pulaski Land & Improvement Co.; put in operation Jan. 1, '92; name changed to Pulaski Light & Water Co. FRANCHISE.—25 yrs. from '92; does not provide for purchase of works by city. No legal difficulties. SUPPLY.—Artesian wells, pumping to tank. PUMP.—Cap., 1,000,000 galls.; Gordon dup. Bituminous coal used; av. cost, $2.85 per short ton. TANK.—

Cap., 258,000 galls.; iron; 35 × 35 ft., on ground. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles. Taps, 200; made by Co., free. Services, iron; paid for by consumer. Meters, 105; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 62; private, 2. CONSUMPTION.—(Galls.) av., 70,000; max., 85,000; min., 55,000. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $50,000; all paid-up; paid 8½% div'd in '95. Expenses: Operating, $1,550; taxes, $191. Revenue: Consumers, metered, $1,535; City, fire protection, $1,860. MANAGEMENT.—Prest., J. H. Dingee; Secy., H. E. Wolbert; Treas., W. H. Triol; Supt., M. W. Bryan; Ch. Pump, Engr., J. T. Jackson. Rept. by Secy., June 5, '96. SEWERS.—None.

36. **RADFORD,** Montgomery Co. (2,060.) Built in '90 by Radford Land & Improvement Co. SUPPLY.—Connelley's branch of New River, pumping to subsiding reservoir, thence to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Holly hor. dup. RESERVOIR.—Is 142 × 277 ft., 14½ ft. deep. STAND-PIPE.—Cap., 183,589 galls.; steel; 25 × 50 ft., on 200 ft. elevation. DISTRIBUTION.—Mains, 7½ miles. NOTE.—No rept. since '90-1 Manual.

37. **RICHLANDS,** Tazewell Co. (Not given.) Built in '90-1 by Richland Water, Gas & Electric Light Co. SUPPLY.—Clinch River, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup. STAND-PIPE.—Cap., 183,000 galls.; 25 × 50 ft. DISTRIBUTION.—Mains, 3 miles. Taps, 100. Services, galv. i. Hydrants, 35. PRESSURE.—Ordinary, 80 lbs.; fire, 80 to 125 lbs. FINANCIAL.—Cost, $45,000. NOTE.—No rept. since '90-1 Manual.

38. **RICHMOND,** Henrico Co. (81,388.) Built in '30 by city. SUPPLY.—James River, pumping by water power and steam as auxiliary, to reservoirs. PUMPS.—Cap., 23,000,000 galls. Old station: Six low breast wheels, driving double acting horizontal piston pumps; one Jonval turbine wheel running two double acting piston pumps. Total cap., 6,000,000. New station: Three sets of water power vertical plunger pumps, three single acting pumps, three sets double Leffel special turbines. Total power cap., 12,000,000 galls. One reserve Worthington steam pump, 5,000,000 comp. cond. Bituminous Pocahontas coal used; av. cost, $3.60 per short ton. RESERVOIRS.—Cap., 56,000,000 galls. Two storage, 10,000,000 and 46,000,000. TANK.—Press rept., Aug., '96, stated contract for tank or stand-pipe had been let to Chicago Bridge & Iron Co. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 94.26 miles: Pumping, 5.43; supply, 2.08; distributing, 86.75; cost extensions met by appropriations. Taps, 13,800; in use, 11,000; made by city, free. Services, lead; paid for by consumer. Meters, 1,283; in use, 850; owned by city and consumers; controlled by city; repairs paid by owner of meter; yearly rental, $2. Use of meters optional with consumer. Hydrants, public, 549; private, 20. CONSUMPTION.—(Galls.) av., 12,000,000; max., 17,000,000; min., 10,810,000. PRESSURE.—Ordinary, 12 to 20 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,653,031. Debt, $304,185. Expenses, operating, $41,975. Revenue, $168,669: Consumers, $139,407; City fire protection, $29,262. No provision for deficits. MANAGEMENT.—Ch. Pump. Engr., Alex. Dulany. Rept. by Supt., Chas. E. Bolling, June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 2, '81.

39. **ROANOKE,** Roanoke Co. (16,159.) Built in '84 by Roanoke Land & Improvement Co.; name changed to Roanoke Gas & Water Co., through consolidation with Roanoke Gas Co. in July, '89. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City pays for public service $20 per hydrant per annum. LEGAL DIFFICULTIES.—In relation to change of grade of streets; Court of Appeals held that city could change grade at its pleasure. SUPPLY.—Spring, pumping to reservoir and direct. Cap., 4,500,000 to 5,750,000 galls. daily. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Holly hor. dup. Bituminous Pocahontas coal used; av. cost, $2.75 per short ton. RESERVOIR.—Cap., 2,500,000 galls; distributing, 194 ft. above and 800 ft. from pumping station. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 49 miles. Taps, 3,166; made by Co., free, including service to curb. Services, galv. i.; paid for by consumer or owner. Meters, 548; owned by Co. and consumer; controlled by Co.; repairs paid by both; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 119; private, 4. CONSUMPTION.—(Galls.) av., 1,966,278; max., 2,700,000; min., 1,700,000. PRESSURE.—Ordinary and fire, 45 to 90 lbs. Steam fire engines are only used in suburbs and on hills. FINANCIAL.—Cost, $427,047. Cap. Stock: Authorized, $2,000,000; paid-up, $600,000; paid 6% div'd in '95. Bonded debt, $100,000, at 5%. Expenses: Operating, $20,192; taxes, $1,571, including $500 city license. Revenue: Consumers, unmetered, $27,936; metered, $19,733; City, fire protection, $2,380; sewer flushing, $554. MANAGEMENT.—Prest., F. J. Kimball; Secy. and Treas., H. E. Gerhard, both of 333 Walnut St., Philadelphia; Mgr. and Engr., J. C. Rawn. Rept. by Mgr., June 5, '96. SEWERS.—Has sanitary and storm sewers.

40. **SALEM,** Roanoke Co. (3,279.) Built in '75-6 by town. SUPPLY.—Springs, pumping to stand-pipe, surplus passing to reservoir. PUMPS.—Cap., 936,000 galls.; 216,000 and 720,000. Bituminous Pocahontas coal used; av. cost, $2.44 per short

ton. RESERVOIR.—Cap., 275,000 galls.; distributing and storage, 185 ft. above town. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by general fund. Taps made by consumer. Services, galv. i.; paid for by owner. Meters, 4; owned and controlled by town; repairs paid by owner. Use of meters compulsory for factories. City can compel use of meters and any consumer may have one. Hydrants, public, 64. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $1,200. Expenses, operating, $1,200. Revenue, about $4,000. MANAGEMENT.—Prest., J. E. Shipman. Rept. by Prest., June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 27, '83.

P S. SHENANDOAH, Page Co. (751.) Projected by Milnes Water Co. for some years, but probably will not be built for a year or more. Rept. by Engr., H. N. Sims, Altoona, Pa., Dec. 7, '96.

41. SOUTH BOSTON, Halifax Co. (1,789.) Built in '88 by city, originally for fire protection only. SUPPLY.—Pumping direct and to stand-pipe. PUMPS.—Cap., 800,000 galls.; Worthington comp. non-cond. STAND-PIPE.—Cap., 60,000 galls.; 12 x 75 ft. DISTRIBUTION.—Mains, 1½ miles, c. i. Taps, 25. Meters, 0. Hydrants, 13. CONSUMPTION.—(Galls.) av., 3,060. PRESSURE.—Ordinary and fire, 82 lbs. FINANCIAL.—Cost, $20,000. Expenses, operating, $1,200. MANAGEMENT.—Prest. and Supt., T. H. Mebane, Jr.; Secy., F. Falkner; Treas., R. R. Nobling. Rept. by Supt., Jan. 15, '97. SEWERS.—None.

42. STANLEY, Henry Co. (Not given.) Built in '89 by Stanley Furnace & Land Co. SUPPLY.—Impounding reservoir, by gravity. FINANCIAL.—Cost, $10,000. NOTE.—No rept. since '90-1 Manual.

43. STAUNTON, Augusta Co. (6,975.) Built in '76-7 by city. SUPPLY.—Ten springs, collected in 2 miles of stoneware pipe, pumping from receiving to distributing reservoir. PUMPS.—Cap., not given.; 1,250,000 Worthington comp. cond., also Deane. RESERVOIR.—Cap., 2,500,000 galls.; 182.6 ft. above pumps. DISTRIBUTION.—Mains, 10 miles. Taps, 325. Meters, 5. Hydrants, 53. CONSUMPTION.—(Galls.) av., 57,800. FINANCIAL.—Cost, $200,000. No debt. Expenses, $4,000. Revenue, Consumers, $12,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, June 24, '82.

44. SUFFOLK, Nansemond Co. (3,854.) Built in '89 by Nansemond Water Co. SUPPLY.—Portsmouth Water Works. DISTRIBUTION.—Mains, 6.5 miles. Taps, 156. Meters, 12. Hydrants, 40. FINANCIAL.—Cap. Stock (in '88), $10,000. Expenses, $1,000. Revenue, $7,728: Consumers, $5,728; City, fire protection, $2,000. NOTE.—No rept. since '90-1 Manual.

45. TAZEWELL, Tazewell Co. (Est., 1,100.) Built in '86-8 by village. SUPPLY.—Spring, by gravity. RESERVOIR.—Cap., 35,000 galls.; 170 ft. above town. DISTRIBUTION.—(In '88.) Mains, 1.3 miles. Taps, 20. Services, w. i. Meters, 0. Hydrants, 7. FINANCIAL.—(In '88.) Cost, $5,000. Bonded debt, $4,000, at 6%. Expenses, $390: Operating, $150; int., $240. Revenue, consumers, $350. NOTE.—No rept. since '89-90 Manual.

—? VINTON, Roanoke Co. (1,057.) Built in '90 by Roanoke & Vinton Light & Water Co. Rept. by J. T. Rhodes, Town Clk., Sept. 28, '96, states that the works have been completed, but never put in operation, owing to the inability of the Co. to pay for the plant. Supply, springs and subsiding reservoir, pumping to stand-pipe of 300,000 galls. cap. by 500,000 gall. Deane comp. dup. pump. Mains, 2½ miles. Cost $32,000. Cap. Stock, $50,000.

46. WARRENTON,, Fauquier Co. (1,346.) Built in '90 by town; put in operation Nov. 1. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 1,250,000 galls. DISTRIBUTION.—(In '90.) Mains, 4 miles. Hydrants, 20. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $20,000. Expenses, Operating, $150. Revenue, $1,200. MANAGEMENT.—Rept. by Treas., A. Fletcher.

47. WINCHESTER, Frederick Co. (5,196.) Built in last century by town; rebuilt in '94. Engr. for new works, Alex. Potter, 187 Broadway, N. Y. City. SUPPLY.—Originally spring ¼ mile from and 50 ft. above village, by gravity. Bids for new works in '94 were on new pumping station, reservoir and 6 miles mains. PUMPS.—Cap., 750,000 galls.; Nordberg hor. cond. (Rept. by agent.) DISTRIBUTION.—Mains, 8.5 miles. Taps, 1,000. Meters, 0. Hydrants, 29. FINANCIAL.— Expenses, $800. Revenue, $3,000. MANAGEMENT.—City Council. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Engr. News, Mar. 3, '83.

48. WYTHEVILLE, Wythe Co. (2,570.) First supplied in '88 by Co. In '89 village built works. SUPPLY.—Spring, pumping from storage to high-service reservoir. PUMPS.—Cap., 750,000 galls.; Worthington comp. non-cond. RESERVOIRS.—Storage, no data; high service distributing, 1,000,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, about 5 miles. Taps, 185. Meters, 5. Hydrants, public, 21. FINANCIAL.—Cost, $25,462. Debt, $23,000, at 6%. Sinking Fund, $4,928. Revenue, consumers, $1,900. MANAGEMENT.—Mayor, W. L. Stanley; Chn. Water Com., J. G. Brown. Rept. by Mayor, Sept. 24, '96.

WEST VIRGINIA.

P 1. **BAYARD,** Grant Co. (Est., 190.) Town voted for works in fall of '96. SUPPLY.—Spring. Est. cost, $10,000. Rept. by J. H. Marshall, Nov, 5, '96.

1. **BERKELEY SPRINGS,** Morgan Co. (Est., 800.) Built in '94 by Berkeley Springs Water-Works & Improvement Co.; town owns $10,000 of stock. Put in operation in May. Engr., Jas. Lockhart. SUPPLY.—Spring, pumping to reservoir. PUMPS.—Cap., 86,000 galls.; Knowles (special order). Bituminous run of mine coal used; av. cost, $2.50 per short ton. RESERVOIR.—Storage; on mountain; about 50 ft. sq. at surface and 12 ft. deep. FISCAL YEAR CLOSED Nov., '96. DISTRIBUTION.—Mains, 1 to 2 miles; cost extensions met by Co. Taps, made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 25. FINANCIAL.—Cost, $20,000. Cap. Stock: authorized, $50,000; paid-up, $14,300. Floating debt, $10,000; bonded, $5,900, at 6%, due in 1908. Expenses: Operating, $1,600. Revenue: City, fire protection, $450. MANAGEMENT.—Prest., Eugene Van Rensselaer; Secy., J. Hammond Silver. Rept. by Prest., Jan. 6, '97, in person. SEWERS.—Has sanitary sewers.

2. **BLUEFIELD,** Mercer Co. (1,775.) Bought Sept. 24, '90, by Bluefield Water-Works & Improvement Co.; built in '88 by Norfolk & Western R. R. Co.; enlarged in '94. Engr., E. Graves. FRANCHISE.—50 yrs. from '90; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for excess of hydrants above 18, which are allowed free of charge. No legal difficulties. SUPPLY.—Six mountain springs, by gravity; also Beaver Pond. PUMP.—Cap., 1,000,000 galls.; Worthington simple high pressure. Bituminous lump coal used; av. cost, $1.85 per short ton, and mine run, $1.55. RESERVOIR.—Distributing. TANK.—Cap., 250,000 galls.; iron; 85 × 35 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 12 miles; cost extensions met by proceeds of mortgage bonds. Taps, 430; made by Co., free. Services, ¾-in. galv. i.; paid for by Co. Meters, 6; owned, controlled and repaired by Co. Hydrants, public, 16; private, 2. PRESSURE.—Ordinary, 60 to 80 lbs. FINANCIAL.—Cost, $85,000. Cap. Stock: Authorized, $252,000; all paid-up; paid 1% div'd in '95. Floating debt, $18,333, at 6%; bonded, $78,000, at 7%; due Jan. 1, 1913. Sinking Fund, $12,000, invested in purchased and cancelled mortgage bonds. The affairs of water-works are combined with those of the land and improvement features. MANAGEMENT.—Prest., J. H. Dingee, 333 Walnut St., Philadelphia; Secy. and Treas., Malcolm W. Bryan, Roanoke, Va.; Supt., Geo. H. Hill. Rept. by Secy., June 23, '96. SEWERS.—None.

3. **BRAMWELL,** Mercer Co. (499.) Built by Bramwell Water Co.; put in operation Jan. 1, '96. Engr., H. M. Bell, Jr. No Contr. FRANCHISE.—50 yrs. from '95; provides for purchase of works by city within 60 days from expiration. If city does not purchase within 60 days, franchise extends for 50 yrs. more. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $25 per hydrant per annum. No legal difficulties. SUPPLY.—100 acres of drainage area, all wooded, owned by Co. RESERVOIR.—Cap., 7,000,000 galls.; impounding, area, 2 acres; 21 ft. deep. DISTRIBUTION.—Mains, 3 miles. Taps, 73; made by Co., including service to curb and box. Services, galv. i.; paid for by house owner. Meters, 0. Use of meters optional with Co. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 30,000; max., 40,000; min., 20,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $12,000. Cap. Stock: Authorized, $50,000; paid-up, $12,000. No debt. Taxes, not assessed. Revenue: Consumers, unmetered, $800; City, fire protection, $250. MANAGEMENT.—Prest. and Supt., H. W. Shields; Secy. and Treas., H. M. Bell, Jr. Rept. by H. M. Bell, Jr., July 13, '96. PROJECTED IMPROVEMENTS.—Enlargement of reservoir. SEWERS.—Has sanitary sewers.

4. **CHARLESTON,** Kanawha Co. (6,742.) Built in '86 by Charleston Water-Works Co. FRANCHISE.—20 yrs.; provides for purchase of works by city at intervals of five yrs. Rates are fixed in franchise and subject to regulation by city. SUPPLY.—Elk River, pumping direct. PUMPS.—Cap., 5,500,000 galls.; 2—1,500,000 Deane; 1—2,500,000 McGowan comp. dup. (rept. by maker.) FILTERS.—Cap., 500,000 galls.; Hyatt (or New York). FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 21 miles. Taps, 1,750. Services, kal. i. Meters, 100. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 1,800,000. FINANCIAL.—Cost, $150,000. Cap Stock, $47,200. Bonded debt, $110,000. Expenses: Int., $6,600; taxes, $1,600. Revenue, $24,000. MANAGEMENT.—Prest., E. B. Knight; Secy., W. S. Laidley; Treas. and Supt., Frank Woodman. Rept. by J. A. de Gruytes, for Co.

5. **CHARLES TOWN,** Jefferson Co. (2,287.) Built by Charles Town Water & Mfg. Co. FRANCHISE.—Perpetual. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Not given. PUMPS.—Water power and supplementary steam. DISTRIBUTION.—Meters, 0. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 100,000. One steam fire engine is used. Revenue, $450. MANAGEMENT.—Pres., R. P. Chew; Secy. and Treas., Geo. Washington. Rept. by Supt., B. C. Washington, Nov. 20, '96. SEWERS.—None.

6. **CLARKSBURGH,** Harrison Co. (3,008.) Built in '88 by town. SUPPLY.—West fork of Monongahela River, pumping to tanks. PUMPS.—Cap., 500,000 galls.; two Deane comp. dup. TANKS.—Cap., 560,000 galls; two 280,000 steel; 40 × 30 ft., 340 ft.

above pumps. DISTRIBUTION.—Mains, 6.5 miles. Hydrants, 51. FINANCIAL.—Cost, $50,000. Bonded debt, $50,000, at 5%. NOTE.—No rept. since '89-90 Manual.

P 2. **ELKINS,** Randolph Co. (737.) Works designed in '94 by Alex. Potter, 137 Broadway, N. Y. City. Likely to be constructed in '97. Rept. by Engr., Jan., '97.

7. **ELM GROVE,** Ohio Co. (594.) Built in '95 by Suburban Light & Water Co.; put in operation in Dec. Engrs., Brown & Haslett.; Contrs., Hallock & Lang, all of Wheeling. Supplies Wheeling Park. FRANCHISE.—Rates are not fixed in franchise, nor subject to regulation by city. Plant only supplies suburban residences, including Wheeling Park, from 3 to 8 miles outside of Wheeling. SUPPLY.—Wheeling Creek, pumping to impounding reservoir and tanks. PUMPS.—Cap., 2,000,000 galls.; 1,000,000 McGowan comp. dup.; 1,000,000 Deane. Bituminous run of mine coal used; av. cost, $1 per short ton. FILTER.—Crib, filled with sand, coke and gravel. RESERVOIR.—Cap., 1,800,000 galls. TANKS.—Cap., 500,000 galls.; 2—250,000; wood. DISTRIBUTION.—Taps, about 100; made by Co. for $1.50. Services, lead; paid for by consumer. Meters, about 85; owned, controlled and repaired by Co. Use of meters compulsory for all consumers, except those in Wheeling Park, which is supplid through a 6-in. main. Hydrants, public, 10, private, 10. CONSUMPTION.—(Galls.) av., 25,000; max., 35,000; min., 15,000. PRESSURE.—Ordinary, 85 lbs. Steam fire engines are rarely necessary. FINANCIAL.—Cost, about $100,000. Expenses, Operating, about $1,000. Revenue: Consumers, unmetered, $1,000; metered, $3,500. MANAGEMENT.—Prest., Anton Reymann, Wheeling; Secy., P. O. Reymann; Ch. Pump. Engr., Chas. Brandfass. Rept. by Supt., J. H. Beans, Jan. 2, '97.

23. **FULTON,** (P. O. Wheeling), Ohio Co. (Est., 491.) Water furnished by Wheeling at Wheeling rates. About one mile mains and 11 hydrants.

8. **GRAFTON,** Taylor Co. (3,159.) Built in '94 by town; put in operation Dec. 23. Engrs., Wilkins & Davison, Pittsburg. Alex. Potter, 137 Broadway, N. Y. City, repts. he was Des. Engr. and Wilkins & Davison, Const. Engrs. Contrs., Bennett & Talbott, Fairmount. SUPPLY.—Tygarts Valley River, by pumping. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Snow. Natural gas used; av. cost, $50 per mo. TANK.—Cap., 442,000 galls.; steel; 50 × 30 ft., on hill. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by water rents. Taps, 239; made by town for $8 for ½-in., $9 for ¾-in., $10 for ¾-in., $11 for 1-in., including service to curb in each case. Services, iron or lead; paid for by property owner from curb. Meters, 12; owned and repaired by consumer; controlled by town. Use of meters optional with consumer; compulsory for power purposes. Hydrants, public, 55. CONSUMPTION. (Galls.) av., 400,000. PRESSURE.—Ordinary, 174 lbs. FINANCIAL.—Cost, $41,000. Bonded debt, $40,000, at 5%; due 1904-'14. Sinking Fund, $4,500, invested in town street improvement bonds, at 5%. Expenses: Operating, $2,300; int., $2,000. Revenue: Consumers, unmetered, $3,300; metered, $338. MANAGEMENT.—Supt., C. E. Compton; Ch. Pump. Engr., M. F. Carr. Rept. by S. M. Musgrove, Clk., Aug. 6, '96. SEWERS.—Sanitary sewers under construction.

10. **GUYANDOTTE,** Cabell Co. (1,502.) Supply from Huntingdon.

9. **HINTON,** Summers Co. (2,570.) Built in '90-1 by Hinton Water-Works Co.; put in operation May 1, '91. FRANCHISE.—99 yrs. from '90. Rates are fixed in franchise and subject to regulation by city. Co. is exempt from local taxes. City to pay $30 per annum for first 30 hydrants and $25 for each additional. No legal difficulties. SUPPLY.—Greenbrier River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls. 2—500,000 Smith-Valle dup. Bituminous red ash coal used; av. cost, $1.47 per short ton. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 5.4 miles; cost extensions met by earnings. Taps, 321; made by Co. at $7 for single and $9 for double street service. Services, lead goose neck and iron; paid for by owner. Meters, 14; owned by consumer; controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 42; private, 2. CONSUMPTION.—(Galls.) av., 325,000. PRESSURE.—Ordinary, 145 lbs.; fire, 145 to 160 lbs. FINANCIAL.—Cost, $28,740. Cap. Stock: Authorized, $50,000; paid-up, $28,740. No debt. Expenses, $2,300: Taxes, $10. Revenue: Consumers, unmetered, $5,146; metered, $362; City, fire protection, $1,200, included in amount stated for unmetered water. MANAGEMENT.—Prest., J. C. James; Secy., H. Ewart; Treas., A. G. Flanagan; Supt., F. R. Van Antwerp; Ch. Pump. Engr., R. W. Ervin. Rept. by Supt., June 6, '96. SEWERS.—Has sanitary sewers only.

10. **HUNTINGDON,** Cabell Co. (10,108.) Now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa.; built in '87 by Huntindon Water Co. Supplies Guyandotte. FRANCHISE.—Provides for purchase of works by city in '98, and at intervals of 5 yrs. thereafter, price to be determined by arbitation. Rates are fixed in franchise. SUPPLY.—Ohio River, pumping to reservoir and direct. PUMPS.—Cap., 5,750,000 galls.: 2,000,000 Gordon, 2,250,000 Hall, 1,500,000 Worthington. FILTERS.—Cap., 400,000 galls.; National (or New York). RESERVOIR.—Cap., 2,000,000 galls.; 261 ft. above main streets of city. DISTRIBUTION.—Mains, 20 miles. Hydrants, public, 152. PRESSURE.—Ordinary and fire, 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. F. Cockburn, Bellevue, Pa.; Secy., A. E. Claney; Treas., E. B. Fogle; Supt., W. W. Adams. Rept. by Am. W.-W. & G. Co., Aug. 20, '96.

11. **KEYSER,** Mineral Co. (2,165.) Built in '93 by town; put in operation in Dec. Engr. and Contr., D. G. Addlesburger, Baltimore, Md. SUPPLY.—Mountain spring, by gravity from reservoir. Spring is on Knobly Mt., 4 miles from, 287 ft. above village. RESERVOIR.—Impounding; area, 1 acre. DISTRIBUTION.—Taps, 200; made by consumer. Services, iron; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 40. PRESSURE.—Ordinary, 135 lbs. FINANCIAL.—Cost, $43,000. Bonded debt, $41,000, at 6%, due in 1903-23. Sinking Fund, $1,200. Expenses: Operating, $250; int. on bonds, $2,460. Revenue, consumers, $1,800. A tax of 25 cts. on $100 of real and personal property is levied annually for water-works. MANAGEMENT.—Prest., Jas. A. Sharpless; Secy., W. N. Offutt; Treas., Chas. F. Vest; Supt., E. C. Rinehart. Rept. by W. N. Offutt, Aug. 8, '96. SEWERS.—Has partial storm sewers.

12. **MANNINGTON,** Marion Co. (908.) Bought about '93 by village from Mannington Water Supply Co., which built works about '91. SUPPLY.—Drilled wells, pumping to tanks and direct. Three wells, 120 ft. deep. PUMPS.—Cap., 230,000 galls.; 2—115,000 dup.; Miller and Snow. Natural gas used; av. cost, $50 per month. TANKS.—Cap., 75,000 galls.; two. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 2 miles. Taps, 200; made by city for $5. Services, lead; paid for by consumer. Meters, 0. Cannot compel the use of meters, but a consumer may have one. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 75,600. PRESSURE.—Ordinary, 130 lbs.; fire, 160 to 200 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $5,000. Revenue from city $2,000 for fire protection, sewer flushing and other purposes. MANAGEMENT.—Prest., J. B. Marr; Secy., D. A. Rymer. Rept. by Supt., J. M. Barrack, Sept. 7, '96.

13. **MARTINSBURG,** Berkeley Co. (7,226.) Built in '73-4 by city. SUPPLY.—Springs, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Holly hor. Bituminous coal used; av. cost, $2.70 per short ton. FISCAL YEAR CLOSED May 11. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by city. Taps, 800; made by city for $2 each. Services, iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 65; private, 8. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary, 60 lbs.; fire, 85 lbs. One steam fire engine is owned, but not used. FINANCIAL.—Expenses: Operating, $3,000; int., 5%. Revenue, $5,000. Deficits are met by general taxation. MANAGEMENT.—Town Clerk, A. F. Lambert; Supt. and Ch. Pump. Engr., J. M. Shaffer. Rept. by Supt. PROJECTED IMPROVEMENTS.—Jan., '97, Supt. rept. that there was talk of adding a 2,500,000-gall. pump. REFERENCE.—Eng. News, Feb. 11, '82.

14. **MORGANTOWN,** Monongalia Co. (1,011.) Built in '89 by Union Improvement Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay $40 per hydrant per annum. No legal difficulties. SUPPLY.—Mountain streams, by gravity and by pumping from Monongahela River in dry seasons. PUMP.—Cap., 378,000 galls.; Snow dup. Natural gas used. RESERVOIR.—Cap., 510,000 galls.; impounding. TANKS.—Cap., 128,000 galls.; 2—64,000. FISCAL YEAR CLOSED Dec. 30, '95. DISTRIBUTION.—Mains, 14 miles; cost extensions met by earnings. Taps, 200; made by Co. Services, iron and lead; paid for by consumer. Meters, 0. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 160,000. PRESSURE.—Ordinary, 60 to 115 lbs., according to elevation. FINANCIAL.—Cost, $50,000. Cap. Stock (includes also gas plant for natural gas): Authorized, $100,000; paid-up, $75,000; paid 9% div'd in '95. Floating debt, $9,000. Expenses, about $5,400. Revenue, City, fire protection, $680. MANAGEMENT.—Prest., J. W. Rowland, Franklin, Pa.; Secy. and Treas., O. W. Sloan, Emlenton, Pa.; Supt., E. M. Grant; Ch. Pump. Engr., C. Klaproth. Rept. by Supt. SEWERS.—Has sanitary and storm sewers.

15. **MOUNDSVILLE,** Marshall Co. (2,688.) Built in '95 by Moundsville Water-Works Co.; put in operation in July. Engr., J. F. Burley. Contr., Chas. Rosser, Bellaire, O. FRANCHISE.—50 yrs. from '93. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes "as to personal property." City to pay $50 per hydrant per yr. No legal difficulties. SUPPLY.—Ohio River, pumping to stand-pipe. PUMP.—Cap., 2,000,000 galls.; Worthington simple high pressure, one being vert. Coal used; av. cost, 95 cts. per short ton. STAND-PIPE.—Cap., 180,000 galls.; steel, 15 × 100 ft., on stone masonry foundation. DISTRIBUTION.—Mains, 6 miles. Taps, 108; made by Supt. of Co. for $1 for ¾-in. Services, lead; paid for by consumer. Meters, 2; owned by Co. Use of meters optional with consumer; compulsory for railroads and manufacturers. Hydrants, public, 31. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 70 lbs; fire, 95 lbs. FINANCIAL.—Cost, $65,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $50,000, at 6%, due 1915. Expenses: Operating, $1,500; int., $3,000; taxes, $146. Revenue: Consumers, unmetered (est.), $1,700; metered, $1,050; City, fire protection, $1,550. MANAGEMENT.—Prest., Geo. H. Browne, Pittsburg; Secy., J. W. Burchmal; Treas., J. D. Burley. SEWERS.—No sewers.

D 1. **NEW CUMBERLAND,** Hancock Co. (2,305.) Built in '94 by individual; put in operation Nov. 21; only domestic supply yet furnished, but see Franchise below. Franchise, unlimited (unless by State laws.—Ed.); provides for purchase of works by city at any time, price to be determined by arbitration. Rates not to exceed by more than 30% those for similar services "for the time being by the Toronto village

water-works, of Toronto, O." City to have water free for all fire hydrants it desires; city to pay expense of furnishing and setting hydrants. Supply, Ohio River, pumping by means of 84,000-gall. Worthington pump to 115,000-gall. tanks. Mains, 1.7 miles. Taps, 78. Services, lead and galv. 1. Hydrants, public, 1. Pressure, ordinary and fire, 100 lbs. Cost, $8,000 (not completed). Will issue $6,000 of first mortgage bonds Apr. 1, '97. Rept. by Geo. B. Walmer, Jan 19, '97. No sewers.

16. **NEW MARTINSVILLE,** Wetzel Co. (692.) Built in '96 by town; put in operation Dec. 15. Engr., E. J. Millar, Wheeling. Contrs., Caleb & Conture, Bridgeport, O. SUPPLY.—Ohio River, pumping to tanks. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Worthington simple high pressure. Pittsburg bituminous coal used; av. cost, $2 per short ton. TANKS.—Cap., 100,000 galls.; 2—50,000. DISTRIBUTION.—Mains, 2⅛ miles. Taps, made free. Services, lead; paid for by property owner. Hydrants, public, 19. PRESSURE.—Ordinary, 85 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $10,400. Bonded debt, $10,500. MANAGEMENT.—Prest., Jacob Koonts; Ch. Pump. Engr., M. Snodgrass. Rept. by E. J. Millar, Dec. 16, '96. SEWERS.—No sewers.

17. **PARKERSBURG,** Wood Co. (8,408.) Built in '85 by city. SUPPLY.—Ohio River, pumping to tanks. PUMPS.—Cap., 1,000,000 galls.; Wilson & Snyder. TANKS.—Cap., 2,000,000 galls.; 2—1,000,000; iron. DISTRIBUTION.—(In '88.) Mains, 13 miles. Taps, 315. Meters, 4. Hydrants, 63. PRESSURE.—About 80 lbs., in Jan., '97. FINANCIAL. —(Jan., '97.) Cost, $131,000. Bonded debt, $80,000, at 6%. Expenses, $8,800: Operating, $4,000; int., $4,800. Revenue: Consumers, $11,649. MANAGEMENT.—Supt. (Jan. 7, '97), N. S. Caswell. NOTE.—No rept. since '90-1 Manual, except as noted above; later rept. by the Mayor, R. Thomas. REFERENCE.—Cleaning intake, Eng. News, Dec. 21, '93.

18. **PIEDMONT,** Mineral Co. (2,100.) Built in '98 by city. Engr., Alex. Potter, 137 Broadway, N. Y. City. SUPPLY.—Savage River at its junction with the Potomac, pumping to distributing reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 McGowan dup. twin lever. DISTRIBUTION.—Mains, 4½ miles. Hydrants, public, 80. PRESSURE.—Max., 104 lbs. FINANCIAL.—Cost, $40,000. Rept. by Alex. Potter, Des. Engr., Jan. 22, '97.

D 2. **ROMNEY,** Hampshire Co. (451.) Built in '70-1 by town for domestic use only. Supply, springs, by gravity. Mains, 3-in. 1., 3 miles. Cost, $6,500. No debt. Expenses, $75. No revenue. Supt., W. F. Davis. No rept. since '90-1 Manual.

19. **SALEM,** Harrison Co. (310.) Built in '95 by town; put in operation Oct. 1. Engr., A. L. White; Contr., L. G. Hallock, both of Wheeling. SUPPLY.—Dug well, pumping to tank. TANK.—Cap., 50,000 galls.; wood; on hill. DISTRIBUTION.—Mains, 2 miles. Taps made by consumer. Services, paid for by consumer. Meters, 0. Hydrants, public, 18. CONSUMPTION.—Small. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $5,000. Bonded debt, $5,000, at 6%. Deficits met by taxation. MANAGEMENT.—Prest. and Supt., F. G. Erhet; Secy., Geo. E. Zinn; Treas., A. T. Trough. Rept. by A. L. White, Wheeling, and Secy., Sept., '96. SEWERS.—None.

20. **SISTERSVILLE,** Tyler Co. (469.) Built in '93 by city. Engr., Alex. Potter, 137 Broadway, N. Y. City. Contrs., Hallock & Co., Wheeling; Jas. Maloney, Bellaire, O. SUPPLY.—Ohio River, pumping to tanks. Steel pump well, 14 × 28 ft. PUMP.—Cap., 300,000 galls.; 2—150,000 Snow dup. Gas used; av. cost, $100 per month. RESERVOIR. —Cap., 200,000 galls.; storage. TANKS.—Cap., 50,000 galls.; four, wooden. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 3 miles. Taps, made by bonded plumber for consumer, no fee to city. Hydrants, public, 22; private, 3. PRESSURE.—Ordinary 80 lbs. FINANCIAL.—Cost, about $15,000. Debt, $5,000; due in 10 yrs. Expenses, $5,300. Revenue, $2,906. MANAGEMENT.—Rept. by Supt., P. T. Campbell, Dec. 26, '96.

21. **WELLSBURG,** Brooke Co. (2,235.) Built in '96 by town. SUPPLY.—Ohio River, pumping to reservoir and direct. PUMP.—Cap., 500,000 galls.; Knowles. Gas used. RESERVOIR.—Cap., 250,000 galls.; elev., 265 ft. FISCAL YEAR CLOSED May 4. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by receipts. Taps, 390; made by city for $1. Services, lead; paid for by owner. Meters, 0. Hydrants, public, 27; private, 3. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 100 lbs.; fire, 106 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $22,500, at 6%. Sinking Fund: $1,900, invested at 4%. Expenses: Operating, $1,451; int., $1,350. MANAGEMENT.—Water Board; Prest., J. E. Montgomery; Secy., Chas. McCarnie; Supt., N. Nelson. Rept. by E. A. Sheets, of Water Bd., Sept. 3, '96. SEWERS.—Has partial systems of sanitary and storm sewers.

22. **WESTON,** Lewis Co. (2,143.) Built in '96 by Weston Electric Light & Water Co.; put in operation about Oct. 1. Engr., Thos. Pettigrew. Contr., J. A. Fuccy. FRANCHISE.—20 yrs. from '96; provides for purchase of works by city at end of any 5 yrs. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,800 per yr. for 35 hydrants. No legal difficulties. SUPPLY.—West Fork of Monongahela River, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Snow. Bituminous coal used; av. cost, $1.10 per short ton. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, made by consumer for $3. Services, lead and galv. 1.; paid for by house owner. Meters,

0. Hydrants, public, 85. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $18,000. MANAGEMENT.—Prest., Louis Bennett; Secy. and Supt., J. S. Mitchell; Treas., J. S. Lewis. Rept. by Thos. Pettigrew, Aug. 10, '96. SEWERS.—Has partial system of sanitary and storm sewers.

23. **WHEELING**, Ohio Co. (34,522.) Built in '31-4 by town. Supplies Fulton. SUPPLY.—Ohio River, pumping to reservoir. PUMPS.—Cap., 15,000,000 galls.; 2—7,500,000 Holly vert. high duty. Bituminous coal used; av. cost, 75 cts. to $1 per short ton. RESERVOIRS.—Cap., 4,750,000 galls.; storage; high service, 4,000,000; low service, 750,000. DISTRIBUTION.—Taps, made by city at consumer's expense. Services, lead; paid for by property owner. Meters: 6; owned, controlled and repaired by city. Hydrants, public, 370. CONSUMPTION.—(Galls.) av., 7,596,871; max., 10,000,000; min., 6,500,000. PRESSURE.—Ordinary, 40 to 110 lbs. Steam fire engines are used. FINANCIAL.—Expenses: Operating, $40,000. MANAGEMENT.—Prest., H. F. Jones; Secy., John E. Shellhose; Supt., Geo. M. Varney; Ch. Pump. Engr., Wm. Bursee. Rept. by Supt., June 8, '96. Press rept., Feb., '97, stated that Chas. Olliver had just been appointed Supt. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 2, '82; description of reservoir, Mar. 12, '92, illus.

7. **WHEELING PARK** (P. O., Wheeling), Ohio Co. (Not given.) Supply from Elm Grove.

NORTH CAROLINA.

1. **ASHEVILLE**, Buncombe Co. (10,235.) Built in '83 by city. SUPPLY.—Springs and surface water, by gravity from receiving reservoir; and Swananoa River, pumping to stand-pipe. PUMPS.—1—1,000,000 Gordon water power; 1—750,000 Worthington dup. water power. (In addition, makers rept. 750,000 dup. water power and 1,250,000 6-cylinder triple exp. Worthington.) FILTERS.—Cap., 1,500,000 galls.; New York (rept. by makers). RESERVOIRS.—Cap., 400,000 galls. STAND-PIPE.—Cap., 713,000 galls.; steel; 45 × 60 ft. DISTRIBUTION.—Mains, 15 miles. Taps, 500. Meters, 0. Hydrants, 80. CONSUMPTION.—(Galls.) av., 350,000. FINANCIAL.—Cost, $150,000. Bonded debt, $120,000 at 6%. Expenses, Operating, $4,000; int., $7,200. Revenue, $3,660. MANAGEMENT.—Supt., J. L. Murray. NOTE.—No official rept. since '90-1 Manual. REFERENCES.—Eng. News, Jan. 3, '85; stand-pipe failure, Jan. 26, '93, May 3, '94, illus.

F 1. **BRYSON CITY**, Swain Co. (Est., 420.) Built in '89 by town, for fire protection.

2. **CHARLOTTE**, Mecklenburg Co. (11,557.) Built in '81-2 by Charlotte City Water Co. Local press rept. in Dec., '96, stated that R. J. Brevard, Prest. of Co., had offered to sell city 960 out of 1,000 shares of Co.'s stock for $30,000 cash, city to assume $190,000 of bonds, less $7,101 in sinking fund; also that city has accepted offer and that necessary bonds had been sold by city. LEGAL DIFFICULTIES.—Press rept., Sept., '91, stated jury had decided against Co. in suit for $2,200 hydrant rental, for last half of '89; city claimed deficient pressure. SUPPLY.—Springs, pumping from impounding reservoir to stand-pipe. PUMPS.—2,000,000-gall. Blake. (Makers rept. 2,000,000 Worthington comp. non-cond.) FILTERS.—Cap., 1,000,000 galls.; New York, installed June, '96 (rept. by makers). RESERVOIR.—Cap., 10,000,000 galls.; impounding. STAND-PIPE.—Cap., 190,000 galls.; 18 × 110 ft. DISTRIBUTION.—Mains, 15.5 miles. Hydrants, public, 137. CONSUMPTION.—(Galls.) av., 500,000. FINANCIAL.—Bonded debt, $140,000 at 6%, due in 1917. Expenses, $14,491: Operating, $6,068; int., $8,423. Revenue, $20,445: Consumers, $15,997; City, $4,448. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, July 8, '82.

3. **CONCORD**, Cabarrus Co. (4,339.) Built in '84-5 by P. B. Fetzer. FRANCHISE.—25 yrs., exclusive. Contract with city provides for hydrants not over 300 ft. apart. Adding one or more hydrants, at any time, by resolution of the Board of Councilmen, will constitute a renewal of the franchise. Hydrant rental, $40. SUPPLY.—Eno River, pumping to tanks. TANKS.—Press rept., Dec. 12, '96, stated Co. was then renovating two tanks with combined capacity of 125,000 galls. DISTRIBUTION.—Mains (press rept., Dec., '96), 6,500 ft. of 4-in., 10,000 ft. of 1½-in. Hydrants, 8. Separate line of pipe distributes domestic supply, which is also stored in separate tanks. Supply of 30,000 galls. for every 15 hydrants is required to be constantly stored for fire protection. NOTE.—No rept. since '90-1 Manual.

4. **DURHAM**, Durham Co. (5,485.) Built in '86-7 by Durham Water Co. FRANCHISE.—30 yrs. from '86; provides for purchase of works by city after 20 yrs., or every 10 yrs. thereafter. Rates are fixed in contract and subject to regulation by city. Co. is not exempt from local taxes. City to pay $3,500 per yr. for 80 hydrants; $45 each for next 20 and $40 each above that number. LEGAL DIFFICULTIES.—City claims noncompliance with contract; unsettled at present time. SUPPLY.—Nancy Rhodes Creek and Eno River, pumping from impounding reservoir. PUMPS.—Cap., 5,000,000 galls.; Deane: 1,500,000 dup. underwriters'; 1,000,000 dup. high pressure; 2—750,000 water power. Wood

used. FILTERS.—Cap., 900,000 galls.; Warren. RESERVOIRS.—Cap., 204,000,000 galls.; impounding, 200,000,000; distributing, 4,000,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 25 miles; cost extensions met by earnings. Taps, 552; made by Co. Services, galv. 1.; paid for by consumer. Meters: 118; owned and repaired by consumer; controlled by Co. Use of meters optional with consumer; compulsory for large consumers. Hydrants, public, 100; private, 16. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—Ordinary, 67½ lbs.; fire, 90 lbs. FINANCIAL.—Cap. Stock: Authorized, $125,000; all paid-up. Floating debt, $66,955, at 6%; Bonded, $125,000, at 6%. Expenses: Operating, $4,528; int., $10,540; taxes, $685. Revenue: City, fire protection, $4,385. MANAGEMENT.—Prest., Leo. D. Heart; Secy. and Treas., John D. Hardy, Boston, Mass.; Supt., J. C. Michie. Rept. by Supt., June 9, '96. SEWERS.—Has partial sanitary sewers. REFERENCE.—Warren filters, Jan. 4, '94, illus.

5, 6. **FAYETTEVILLE,** Cumberland Co. (4,222.)

FAYETTEVILLE WATER, LIGHT & POWER CO.

Put in operation July 1, '98. Engrs. and Contrs., Ferris & Richards, Jersey City, N. J. FRANCHISE.—60 yrs. from '98; provides for purchase of works by city in 1908. Rates are fixed in franchise. Co. not exempt from local taxes. City to pay $50 per yr. per hydrant. No legal difficulties. SUPPLY.—Springs, by gravity, to and from reservoir, with pumping as auxiliary. PUMPS.—Cap., 1,000,000 galls.; Snow water power and 750,000 Snow steam. Coal used; av. cost, $5 per short ton. RESERVOIR.—Impounding; area, 100 acres. STAND-PIPE.—Cap., 105,000 galls.; steel, 13 × 105 ft., on concrete foundation. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 10½ miles; cost extensions met by reserve bonds. Taps, 94; made by Co. for $3. Services, w. i.; paid for by consumer. Meters: 4; owned and repaired by consumer; controlled by Co. Use of meters can be compelled by Co. and any consumer may have one. Hydrants, public, 50; private, 1. CONSUMPTION.—(Galls.) av., 300,000. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $80,000; all paid-up; paid no div'd in '95. Bonded debt, $50,000, at 6%; due 1918. Expenses: Int., $3,000; taxes, $300. MANAGEMENT.—Secy. and Treas., Garwood Ferris, Jersey City, N. J. Rept. by Genl. Mgr., H. De C. Richards, 123 Liberty St., N. Y. City. REFERENCE.—Eng. News, Mar. 29, '84.

FAYETTEVILLE WATER-WORKS CO.

Built in '29. Leased since '75 by S. W. Tillinghast. FRANCHISE.—Does not provide for purchase of works nor regulation of rates by city. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 6,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 4.3 miles. Hydants (in '88), 9. CONSUMPTION.—(Galls.) av., 80,000. FINANCIAL.—Cap. Stock: Authorized, $8,000; all paid-up; paid 8% div'd in '90. No debt. Expenses, $525: Operating, $500; taxes, $25. Revenue: Consumers, $800; City, none. NOTE.—No rept. since '90-1 Manual.

7. **GOLDSBORO,** Wayne Co. (4,017.) Built in '89 by Goldsboro Water Co. FRANCHISE.—30 yrs.; provides for purchase of works by city at the end of 10 yrs. Rates are fixed in franchise. SUPPLY.—Little River, pumping to stand-pipe. PUMPS.—2,000,000 galls.; 2—1,000,000 Worthington; a comp. cond. and a simple high pressure. FILTERS.—Cap., Cap., 500,000 galls.; Warren; installed in '96 (rept. by makers). STAND-PIPE.—Cap., 200,000 galls.; 18 × 110 ft. DISTRIBUTION.—Mains, 8.5 miles. Taps, 150. Meters, 1. Hydrants, 62. CONSUMPTION.—(Galls.), av., 100,000. FINANCIAL.—(In '89.) Cost, $80,000. Bonded debt, $80,000, at 6%. Expenses, $7,880: Operating, $2,580; int., $4,800. Revenue: Consumers, unmetered, $7,000; city, fire protection, $2,790. MANAGEMENT.—(Mar. 25, '96.) Supt., H. P. Dortch. NOTE.—No official rept. since '90-1 Manual.

8. **GREENSBORO,** Guilford Co. (8,317.) Built in '87-8 by Greensboro Water Co.; changed to Greenesboro Water Supply Co., April 6, '96. Press repts. state works went into hands of receiver in '92, and in '96 were sold to satisfy $50,000 mortgage, purchaser paying $31,000 additional. FRANCHISE.—40 yrs. from '88; provides for purchase of works by city at end of 20 yrs. Rates are regulated by contract. SUPPLY.—Creek and springs, pumping to tank. PUMPS.—Cap. (probably), 2,500,000 galls.; two steam and one water power. In '88 cap. rept. as 1,500,000; Blake water power, with auxiliary engine. Makers rept. 1,000,000 Deane comp. dup., added in '92. Bituminous Pocahontas coal used; av. cost, $2.67 per short ton. TANK.—Cap., 100,000 galls.; wood, on brick tower, top 100 ft. high. FISCAL YEAR CLOSED June 7. DISTRIBUTION.—Mains, 12 miles, cost extensions met by bonds. Taps, 300; made by consumer. Services, iron; paid for by consumer. Meters: 20: owned and repaired by Co.; yearly rental, none. Use of meters compulsory for boilers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 125; private, 2. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 45 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $75,000. Bonded debt, $100,000. Expenses: Operating, including int., $5,000. Revenue, $10,500. MANAGEMENT.—Prest. and Supt., Jas. D. Glenn; Secy., W. C. Seddon; Treas., R. R. King; Ch. Pump. Engr., J. W. Tonkin. Rept. by Supt., June 15, '96. SEWERS.—Has storm sewers only.

9. **HENDERSON,** Vance Co. (4,191.) Built in '90-1 by Henderson Water Supply Co.; put in operation May 1, '92. FRANCHISE.—40 yrs. from '92; provides for purchase of works by city after 10 yrs. Co. is not exempt from local taxes. City to pay $40 per hydrant. No legal difficulties. SUPPLY.—Filter-crib in spring-fed lake, by pumping to stand-pipe and direct. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane comp. dup.

Bituminous Cumnock and Pocahontas coals used; av. cost, $3 and $3.50 per short ton, respectively. FILTERS.—Cap., not given; crib. STAND-PIPE.—Cap., 171,860 galls.; steel, 15 x 130 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by bonds. Taps, made by Co. Services, lead and galv. i.; paid for by consumer. Meters: 1; owned, controlled and repaired by Co. Use of meters compulsory for factory. Co. can compel use of meters and any consumer may have one. Hydrants, public, 69; private, 8. PRESSURE.—Ordinary, 50 lbs.; fire, 150 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. Whitwood, Phillipsburg, N. J.; Secy., W. A. Hunt. Rept. by Supt. and Treas., J. H. Midgers, June 6, '96. SEWERS.—None.

10. **HENDERSONVILLE,** Henderson Co. (1,216.) Built in '89-90 by town. SUPPLY.—Springs, by gravity. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 8 miles. Taps, 100. Meters, 0. Hydrants, 18. CONSUMPTION.—(Galls.) av., 20,000. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 6%. NOTE.—No rept. since '90-1 Manual.

P 1. **HIGH POINT,** Guilford Co. (Est., 2,179.) Project has been temporarily abandoned, but may be revived spring of '97. Rept. by R. C. Charles, Sept. 2. '96.

P 2. **LENOIR,** Caldwell Co. (673.) Works are projected, but nothing definite has been done. Rept. by S. T. Pender, Secy. Board of Trade, Dec. 23, '96.

P 3. **LUMBERTON,** Robeson Co. (584.) An artesian well was under construction in fall of '96 and works were projected. Mayor, E. K. Proctor.

P 4. **MONROE,** Union Co. (1,866.) People will vote in spring of '97 on building works. Rept. by W. S. Lee, Feb. 3, '97.

P 5. **MOUNT AIRY,** Surry Co. (1,768.) Bonds for works voted by city early in '96. Engr., R. L. Greenlee, Marion. Supply, spring-fed stream, pumping by water power to stand-pipe. Est. cost, $25,000. Rept. by Asst. Engr., T. B. McCargo, Sept. 5, '96. Later rept. stated that sale of bonds had been postponed until spring.

11. **NEW BURN,** Craven Co. (7,843.) Known as Water & Sewer Co.; owned and operated, chiefly, by Jas. Redmond. Unsigned rept., Sept., '96. Feb. 6, '97 Lewis-Mercer Construction Co., N. Y. City, rept. it had secured franchise for works, including supply from driven wells, 2,000,000-gall. pumping plant, 120-ft. stand-pipe, and 75 hydrants. Press rept. in June, '93, stated that 15 x 120 ft. stand-pipe was being built. May, '94, press rept. stated that works had been tested. June, '94, press rept. stated T. A. Green and Wm. Dunn, Receivers, had just sold plant at auction to Jas. Redmond for $35,025, cash. In '85, A. K. Denison built works, principally for fire protection.

12. **RALEIGH,** Wake Co. (12,678.) Built in '87 by Raleigh Water Co. FRANCHISE.—20 yrs. from '87; provides for purchase of work by city after 10 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Walnut Creek, pumping to tank, and direct for fire protection. PUMPS.—Cap., 8,250,000 galls.; 1—1,250,000 Worthington triple exp.; 2—1,000,000 Smith-Vaile comp. cond. Bituminous mine run coal used; av. cost, $3.70 per short ton. FILTERS.—Cap., 1,500,000 galls.; Hyatt (or New York) and New York. RESERVOIRS.—Cap., 2,000,000 galls.; storage, located at pump-house. TANK.—Cap., 100,000 galls.; iron; 50 ft. high, on brick and stone tower 100 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 29 miles; cost extensions met by bonds. Taps, 1,000; made by Co. for $1.50. Services, lead; paid for by owner. Meters: 125; owned by consumer; controlled and repaired by Co. Use of meters compulsory for all large and a few small consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 125; private, 25. CONSUMPTION.—(Galls.), av., 1,000,000; max., 1,250,000; min., 750,000. PRESSURE.—Ordinary, 50 to 60 lbs.; fire, 75 to 100 lbs. FINANCIAL.—Cost, $221,000. MANAGEMENT.—Prest., Julius Lewis; V.-Prest., A. A. Thompson; Secy. and Supt., A. M. McPheeters, Jr.; Treas., F. H. Briggs. Rept. by Supt., Aug. 24, '96. SEWERS.—Has sanitary sewers only.

D 1. **RUTHERFORDTON,** Rutherford Co. (1,147.) Built in '96 by town; put in operation June 26. Engr., Cap. E. T. Reveley. Built by day's labor. Supply, springs, from 6,000-gall. reservoir. Cost, $1,000. MANAGEMENT.—Rept. by Secy., S. L. Grayson, June 26, '96.

13. **SALEM,** Forsyth Co. (2,711.) Built in '78 by Salem Water Supply Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $25 per hydrant per year. No legal difficulties. SUPPLY.—Wells and springs, pumping by steam and water power. RESERVOIR.—Cap., 1,500,000 galls. (incomplete); distributing. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 6.8 miles; cost extensions met by earnings or sale of bonds, if necessary. Taps, 139; made by Co. for $5. Services, iron; paid for by consumer. Meters, 150; owned, controlled and repaired by Co. yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 6. PRESSURE.—Ordinary, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $38,845. Cap. Stock: Authorized, $250,000; paid-up, $16,600. Paid no div'd in '95. Bonded debt, $24,000 at 6%. Sinking Fund, $1,500. Expenses: Operating, $911; int., $1,901. MANAGEMENT.—Prest., F. H. Fries; Secy. and Treas., H. F. Shaffner; Supt., C. H. Fogle. Rept. by Secy., June 20, '96. REFERENCE.—Eng. News, June 10, '82.

14. **SALISBURY,** Rowan Co. (4,418.) Built in '87 by Moffett, Hodgins & Clarke. FRANCHISE.—20 yrs. from 1887; provides for purchase of works by city. No legal difficulties. SUPPLY.—Crane Creek. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington non-cond.; a comp. and a non-comp. Wood used; av. cost, $1.65 per cord. FILTERS.—Cap., 750,000 galls. American (or New York) and New York. STAND-PIPE.—Cap., 235,000 galls.; iron; 20 × 100 ft., on stone foundation. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 9 miles; cost extensions met by Co. Taps, 200; made by Co. for $3.50. Services, iron; paid for by consumer. Meters, 20; owned by Co. and consumer; controlled by Co.; repairs paid by owner of meter. Use of meters compulsory for R. R. Co. and large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 65; private, 11. CONSUMPTION.—(Galls.) av., 350,000; max., 750,000; min., 250,000. PRESSURE.—Ordinary, 40 lbs.; fire, 65 lbs. FINANCIAL.—Expenses: Operating, $3,475; int., $5,283; taxes, $366. Revenue: Consumers, unmetered, $2,570; metered, $4,328; City, fire protection, $2,740; other purposes, $197. MANAGEMENT.—Prest., J. F. Moffett; Secy., F. B. Roblin; Treas., C. T. Moffett, all of 15 Wall St., New York city; Supt., E. B. Neave. Rept. by Secy., Aug. 18, '96. NOTE.—Dec. 26, '96, S. L. Morrison, Gen. Mgr. Morrison-Jewell Filtration Co., rept. that Southern Ry. Co. was putting in a plant for railway supply, which would also furnish water to one section of city, and includes a 500,000-gall. Jewell filter.

15. **TARBORO,** Edgecombe Co. (1,924.) Built in '89 by town. SUPPLY.—Hendricks Creek, pumping to tanks and direct. PUMPS.—Cap., 1,500,000 galls.; Worthington simple high pressure. TANK.—Cap., 20,000 galls. DISTRIBUTION.—Mains, 1.5 miles. Hydrants, 14. PRESSURE.—Ordinary, 40 lbs.; fire, 110 lbs. FINANCIAL.—No debt. Expenses, $55. No revenue. NOTE.—No rept. since '90-1 Manual. Various repts. in '96 stated that more extensive works would be built by W. Newton Smith and R. S. Neal, if they could secure water from artesian wells.

P 6. **WAYNESVILLE,** Haywood Co. (455.) Town voted $15,000 bonds for works in Mar., '97, but nothing further has been done. Rept. by H. R. Ferguson, Mayor, Dec. 7, '96.

16. **WILMINGTON,** New Hanover Co. (20,056.) Built in '81-2 by Clarendon Water-Works Co. FRANCHISE.—30 yrs. from '81. Rates are not subject to regulation by city, except that one faucet shall not be over $6 per annum. Co. is not exempt from local taxes. City to pay $70 per year for first 75 hydrants, and $50 for each additional one. No legal difficulties. SUPPLY.—Cape Fear River, pumping to stand-pipe, and direct for fire protection. PUMPS.—Cap., 3,000,000 galls.; three Worthington, 500,000; 1,500,000 and 1,000,000. Pine wood slabs used; av. cost, $1.40 per cord. STAND-PIPE. Cap., 212,000 galls.; steel; 20 × 90 ft. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 14.6 miles; cost extensions met by Co. Taps, 786; made by Co. free, including service to curb. Services, galv. w. i.; paid for by consumer from curb. Meters, 430; owned, controlled and repaired by Co. Use of meters compulsory for factory, hotels, stables, etc. Co. can compel use of meters and any consumer may have one. Hydrants, public, 105; private, 44. CONSUMPTION.—(Galls.) av., 540,000; max., 650,000; min., 425,000. PRESSURE.—Ordinary, 47 lbs.; fire, 100 lbs. Steam fire engines are used only in certain localities. FINANCIAL.—Cost, $200,000. Cap. Stock: Common, authorized, $100,000; all paid-up. Debt, $80,000, at 6%. Bonds: Authorized, $80,000; all issued. Expenses: Operating, $14,725. Revenue, $20,725: Consumers, $13,450; City, $7,275. MANAGEMENT.—Prest., J. F. Divine; Secy. and Treas., Geo. W. Kidder; Ch. Engr., John C. Chase; Supt., W. F. Robertson. Rept. by Supt., July 14, '96, and by Ch. Engr., Jan. 30, '97. PROJECTED IMPROVEMENTS.—A filter plant may be erected. SEWERS.—No sewers. REFERENCES.—Eng. News, July 1, '82; stand-pipe failure March 31, '83, June 22, '93, and April 25, '95.

17. **WILSON,** Wilson Co. (2,126.) Built in '98 by city; put in operation July 15. Engr., J. L. Ludlow, Winston; Contr., Guild & White, Chattanooga, Tenn. SUPPLY.—Small stream, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Buffalo. Wood used; av. cost, $1.80 per cord. STAND-PIPE.—Cap., 145,000 galls.; steel; 15 × 110 ft. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 8½ miles. Taps, 150; made by city for $5 for ½-in. and $6 for ¾-in. Services, lead and galv. i.; paid for by consumer. Meters, 26; owned by consumer and city; controlled and repaired by city; yearly rental, $1.40. City can compel use of meters and any consumer may have one. Hydrants, public, 68; private, 3. CONSUMPTION.—(Galls.) av., 60,000; max., 80,000; min., 30,000. PRESSURE.—Ordinary, 44 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $60,000. Debt, $58,000, at 6%. Expenses: Operating, $1,500. MANAGEMENT.—Treas., Jno. Moore; Supt., R. J. Grantham; Ch. Pump. Engr., M. Stockland. Rept. by Supt., June 2, '96. SEWERS.—Has sanitary sewers only.

18. **WINSTON,** Forsyth Co. (8,018.) Bought by city in Oct., '94; built in '81-2 by Winston Co., under 99 yrs.' franchise. SUPPLY.—Two large wells, 18 ft. and 25 ft. diam.; also creeek, pumping to reservoir. PUMPS.—Cap., 1,200,000 galls.; 2—600,000 Smith-Vaile. Bituminous Pocahontas coal used; av. cost, $3.50 per short ton. FILTERS.—Cap., 500,000 galls.; Warren. RESERVOIR.—Cap., 1,200,000 galls. FISCAL YEAR CLOSED March 31. DISTRIBUTION.—Mains, 9 miles; cost extensions met by general taxation. Taps, 290; made by consumer. Services, lead to curb; paid for by consumer. Meters, 150; owned, controlled and repaired by city. Use of meters optional with con-

sumer. Hydrants, public, 120. CONSUMPTION.—(Galls.) av., 300,000; max., 375,000; min., 250,000. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $102,400. Expenses: Operating, $2,200. Revenue, $6,000. MANAGEMENT.—Supt., J. O. Magruder; Ch. Pump. Engr., S. D. Brigham. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Oct. 31, '85.

SOUTH CAROLINA.

1. **ABBEVILLE,** Abbeville Co. (1,696.) Contracts let by city in Jan., '97, to various parties. Engrs., Pownall & Minshall, 150 Nassau St., N. Y. city. SUPPLY.—Deep well, pumping to stand-pipe. PUMPS.—(as proposed.) Cap., 1,500,000 galls.; comp. dup. Also a 400,000 deep-well. STAND-PIPE.—Cap., 120,000 galls.; steel; 16 × 100 ft. DISTRIBUTION.—Mains, 6½ miles. Hydrants, 50. FINANCIAL.—Est., cost, $30,000. MANAGEMENT.—Chn., J. F. Lyon; Secy., R. W. Cannon; Treas., B. S. Barnwell. Rept. by Engrs., Jan., '97.

2. **AIKEN,** Aiken Co. (2,362.) Built in '94-5 by city; tested in March. Engr., Louis G. Barbot, Augusta, Ga. Contrs., Walton & Wagner, Rome, Ga. SUPPLY.—Pumping to tank or stand-pipe. FINANCIAL.—Contract price, $25,400. MANAGEMENT.—Chn. (Apr., '94), H. Busch. Above from Chn. and press repts., in '94 and '95.

3. **ANDERSON,** Anderson Co. (3,018.) Built in '90 by Anderson Water Supply Co., now the Anderson Water, Light & Power Co.; put in operation Sept., '90. FRANCHISE.—25 yrs. from '90. City to pay $4,200 per yr. No legal difficulties. SUPPLY.—Running stream, pumping to stand-pipe from impounding reservoir. PUMPS.—One steam and one electric power. Bituminous coal used. RESERVOIRS.—Cap., 935,000 galls.; impounding, 800,000 and 135,000. STAND-PIPE.—Cap., 200,000 galls.; iron; 18 × 100 ft. DISTRIBUTION.—Mains, 12 miles. Taps, 200; made by consumer. Services, w. i.; paid for by consumer. Meters, 5; owned and repaired by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 84. CONSUMPTION.—(Galls.) av., 150,000; max., 200,000; min., 100,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Cost, $65,000. Cap. Stock, paid-up, $10,000. Bonds, authorized, $75,000. Expenses, $6,500: Operating, $3,000. Revenue: Consumers, $3,000; City, $3,500. MANAGEMENT.—Prest., S. M. Orr; Supt., J. L. Mauldin; Ch. Engr., W. C. Whitner. Rept. by Supt., July 14, '96.

4. **BEAUFORT,** Beaufort Co. (3,587.) Under construction in '96 by Beaufort Water-Works Co. Engr., C. C. Townsend. FRANCHISE.—Co. is exempt from local taxes for 10 yrs. Contract pending. No legal difficulties. SUPPLY.—10-in. driven wells, 60 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 McGowan dup. high pressure. Bituminous coal used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 105,760 galls.; steel; 15 × 80 ft. DISTRIBUTION.—Mains, 1 mile. Services paid for by owner. Hydrants, public (proposed), 10. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. Two steam fire engines. FINANCIAL.—Cap. Stock: Authorized, $25,000; paid-up, $10,000. MANAGEMENT.—Prest., G. Holmes; Secy., W. P. Waterhouse; Treas., F. W. Scheper; Supt., C. C. Townsend. Rept. by Supt. Beaufort Iron Wks., June 23, '96.

5. **CHARLESTON,** Charleston Co. (54,952.) Built in '76-80; owned by City of Charleston Water-Works Co. (Press repts. in '96 stated mortgage had been foreclosed and Co. reorganized as Charleston Water-Works Co.) FRANCHISE.—Provides for purchase of works by city at end of 10 yrs.; time has expired. Rates are fixed in franchise. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artesian wells, flowing into storage reservoirs, thence pumping to stand-pipe. Three wells, each about 2,000 ft. deep, and about 2½ to 5 ins. diam. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Knowles. Pocahontas bituminous coal used. RESERVOIRS.—Cap., 9,000,000 galls.; 3,000,000 and 6,000,000. (Press rept. in '89 stated embankment of largest reservoir had failed.) STAND-PIPE.—Cap., 133,000 galls.; iron; 18 × 80 ft. FISCAL YEAR CLOSED Jan. 31. DISTRIBUTION.—Mains, 33 miles; cost extensions met by Co. Taps, about 1,500; made by Co. Services, iron and lead; paid for by consumer. Meters: About 25; owned, controlled and repaired by Co. Use of meters optional with Co. in certain cases; compulsory for large manufacturers. Hydrants, public, 460. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 15 to 20 lbs.; fire, 40 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Geo. I. Cunningham; Secy. and Treas., Zimmerman Davis; Supt., E. A. Chisholm; Ch. Pump. Engr., Jos. P. Chapman. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 6, '81.

P 1. **CHESTER,** Chester Co. (2,703.) Artesian well down 200 ft. and to go deeper. If successful, vote on $50,000 bonds will be taken. Rept. by City Engr., Jas. Hamilton, Jr., Aug. 22, '96. Press rept., Oct. 8, '96, stated water not yet secured.

6. **COLUMBIA,** Richland Co. (15,353.) Built in (about) '85 by city. SUPPLY.—Broad River; two plants, one steam, used in emergency only, and the other water power, pumping to reservoirs. PUMPS.—Cap., 4,500,000 galls. 3—1,500,000 Worthington dup. (Makers rept. 2—1,500,000 dup. water power and 1,000,000 and 2,000,000 comp. non-cond.

Worthington; probably one of these is no longer in use.) Bituminous coal (East Tennessee) used; av. cost, $4.10 per short ton. FILTERS.—Cap. (less than), 3,000,000; Jewell, gravity. RESERVOIRS.—Cap., 8,000,000 galls. Settling 6,000,000; near pumping station. Distributing, 2—1,000,000. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Taps made by city for $10. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, not given. CONSUMPTION.—(Galls.) av., 1,300,000. FINANCIAL.—(In '88.) Cost, est., $30,000. Deficits are met entirely by taxation. MANAGEMENT.—Rept. by City Engr., Chas. C. Wilson, June 13, '96. PROJECTED IMPROVEMENTS.—An infiltration reservoir and a stand-pipe. SEWERS.—None. REFERENCE.—Jewell filters, May 28, '96.

7. **DARLINGTON,** Darlington Co. (2,889.) Built in '91 by Darlington Light, Water & Power Co., now the Darlington Light & Water Co.; put in operation June 30. Engr., C. C. Anderson. FRANCHISE.—30 yrs. SUPPLY.—Artesian well, pumping to tank and direct for fire protection. PUMPS.—Cap., 144,000 galls.; Smith-Vaile. TANK.—Cap., 40,000 galls. DISTRIBUTION.—Mains, 4 miles. Hydrants, public, 7. PRESSURE.—Ordinary, 65 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $7,000. Cap. Stock: Authorized, $10,000; paid-up, $7,000. Bonded debt, $3,000. Revenue: Consumers, $1,100; City, fire protection, $350. MANAGEMENT.—Prest. and Treas., W. M. Hagersworth; Secy., J. H. Early; Supt., B. B. Forman. Rept. by Prest., Sept. 24, '96.

P 2. **FLORENCE,** Florence Co. (3,395.) City has artesian well and wishes to secure works. In '94, offered to lease well and grant franchise. Nov., '96, works still projected, but no definite plan formed. Repts. by W. W. Hursey, June, '94, and F. H. McLeal, Nov., '96.

P 3. **GAFFNEY CITY,** Spartanburg Co. (1,631.) Town hopes to build works in '97. Supply, creek and wells, pumping to reservoir. Est. cost, $15,000 to $18,000. Rept. by Town Clk., L. Baker, Nov. 2, '96.

F 1. **GRANITEVILLE,** Aiken Co. (1,791.) Built by Graniteville Mfg. Co. for fire protection only. Supply, Horse Creek, lifted by Worthington and Knowles steam and power pumps to 200,000-gall. reservoir. Mains, 2½ miles. Hydrants, 28. Prest., H. H. Hickman, Augusta, Ga. Rept. by Supt., T. H. Rennie, Jan. 18, '97.

8. **GREENVILLE,** Greenville Co. (8,607.) Built in '90-1 by Paris Mountain Water Co.; put in operation Jan., '91. FRANCHISE.—25 yrs. SUPPLY.—Mountain streams, by gravity. RESERVOIR.—Cap., 25,000,000 galls.; storage. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 23 miles. Taps, 758; made by Co. for $4. Services, lead and iron; paid for by consumer. Meters, 14; owned, controlled and repaired by Co. Yearly rental, none. Use of meters optional with Co. Hydrants, public, 147; private, 14. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Treas., J. W. Hawley; Secy., H. Bayard Hodge, 1319 Filbert St., Philadelpjhia; Supt. H. T. Poe. Rept. by American Pipe Mfg. Co., Philadelphia, June 8, '96. SEWERS.—Has sanitary sewers.

P 4. **LAURENS,** Laurens Co. (2,245.) Town voted $30,000 for water and electric plants Sept. 10, '96, and advertised bonds to be sold Nov. 1, '96; bonds 6%, 40-yr., with privilege of redeeming after 20 yrs. Engr., N. Wilson Davis, Atlanta, Ga. Clk. to Comr. Pub. Wks., L. G. Balle. Above from Engr. and bond advertisement. Press rept., Dec., '96, stated bonds had been sold.

P 5. **NEWBERRY,** Newberry Co. (3,020.) Bids for $42,000 6%, 40-yr., water and electric light bonds were to be received Jan. 25, '97, by Comrs. Pub. Wks. After sale of bonds, bids for construction were to be invited. Engr., N. Wilson Davis, Atlanta, Ga. Rept. by Secy., C. A. Bowman, Jan. 18, '97. Press rept. early in '96, stated artesian well had been successfully sunk. Since above was put in type call has been issued for bids to be received March 12, '97.

9. **ORANGEBURG,** Orangeburg Co. (2,964.) Built in '87; now owned by Geo. H. Cornelson, who owned wells from start and bought distribution system from town in '89. FRANCHISE.—10 yrs. from '89. Co. is exempt from local taxes. City to pay $20 per hydrant. No legal difficulties. SUPPLY.—Four artesian wells, by pumping. PUMPS.—Cap., 2,150,000 galls.; 2—450,000 and 1—1,250,000 Worthington. Coal used; av. cost, $3.25 per short ton. RESERVOIRS.—Cap., 450,000 galls.; 200,000 and 250,000. STAND-PIPE.—Cap., 34,592 galls.; iron; 8 × 92 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by owner. Taps, 28; made by owner for $20. Services, ¾-in. iron; paid for by consumer. Meters, 0. Hydrants, public, 104; private, 6. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 45 lbs. One steam fire engine is used. FINANCIAL.—Cost, $23,000. No debt. REVENUE: Consumers, $1,200; City, fire protection, $2,000. MANAGEMENT.—Rept. by owner, June 4, '96. SEWERS.—None.

10. **SPARTANBURG,** Spartanburg Co. (5,544.) Built in '88-9 by Spartanburg Water-Works Co. FRANCHISE.—Provides for purchase of works by city in 1907. Max. rates are fixed in franchise and subject to regulation by city. SUPPLY.—Chinquapin Creek and another creek, pumping to stand-pipe, and direct in case of fire. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane, one comp., one high pressure. Pine wood used; av. cost, $1.65 per cord. RESERVOIRS.—Impounding, formed by three dams on creeks; two small storage basins; storage reservoir of 4,500,000 galls. is now under construction. STAND-PIPE.—Cap., 216,000 galls.; iron; 20 × 92 ft. FISCAL YEAR CLOSED

Jan. 1, '96. DISTRIBUTION.—Mains, about 14 miles. Taps, 690; made by Co. for $5. Services, galv. i.; paid for by owner. Meters, 75; owned both by consumer and Co.; controlled by Co; repairs paid by owner. Co. can compel use of meters and any consumer may have one. Hydrants, public, 110; private, 10. CONSUMPTION.—(Galls.) av., 200,000; max., 400,000; min., 125,000. PRESSURE.—Ordinary, 45 lbs.; fire, 250 lbs. FINANCIAL.—(In '89.) Cost $100,000. Cap. Stock, $100,000. Bonded debt, $85,000. Revenue: City, fire protection, $3,420. MANAGEMENT.—Rept. by Supt., C. W. Harty, Aug. 20, '96.

11. **SUMTER,** Sumter Co. (3,865.) Built in '93 by Sumter Water Co; put in operation in May. Engs. and Contrs., American Pipe Mfg. Co., Philadelphia, Pa. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; two Davidson. Bituminous coal used. STAND-PIPE.—Cap., 293,750 galls.; 20 × 125 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles. Taps, 222; made by Co. for $4. Services, iron and lead; paid for by consumer. Meters, not given. Use of meters optional with Co. Hydrants, public, 67. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., E. F. Partridge; Secy., H. Bayard Hodge, 1319 Filbert St., Philadelphia; Treas., J. W. Hawley; Supt., H. B. Bloom. Rept. by Am. Pipe Mfg. Co., Philadelphia, June 8, '96.

12. **UNION,** Union Co. (1,609.) Press rept., Feb. 4, '97, stated that $40,000 of water and light bonds recently voted would soon be put on market and work begun. Supply, artesian well, about to be bored. Earlier rept. stated T. C. Duncan was a member, and C. Young, Clk. of Comrs.

12. **YORKVILLE,** York Co. (1,553.). Built by city; put in operation Jan. 1, '94. Engr., T. A. Hardman, Olney, Ill. Contr., R. L. Coleman, Columbia. FRANCHISE.—Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $400 for public service. No legal difficulties. SUPPLY.—Spring branch. PUMP.—Cap., 500,000 galls. Wood used; av. cost, $1.25 per cord. RESERVOIR.—Cap., 70,000 galls. STAND-PIPE.—Cap., 60,000 galls.; 12 × 70 ft., on brick tower 50 ft. high; total height 120 ft. FISCAL YEAR CLOSED Mar. 3. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by taxation. Taps, 100; made by city for $5. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary, 62 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $19,000. Bonded debt, $17,000, at 6%; due 1918. Expenses: Operating, $600; int., $1,020; taxes, $1,200. Revenue: Consumers, $1,200. MANAGEMENT.—Rept. by Secy., Treas. and Supt., W. B. Moore, Sept. 5, 1896. SEWERS.—None.

GEORGIA.

1. **ALBANY,** Dougherty Co. (4,008.) Built by city; put in operation Jan., '92. Engr., John C. Chase, Wilmington, N. C. SUPPLY.—Two artesian wells, 10-in. and 4-in., 750 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 2,460,000 galls.; 2—1,230,000 Deane comp. dup. Bacon air lift pump used to increase supply. Alabama bituminous coal used; av. cost, $2.50 per short ton, delivered. RESERVOIR.—Cap., 400,000 galls.; storage. STAND-PIPE.—Cap., 183,580 galls.; steel, 25 × 50 ft., on open steel trestle 80 ft. high. FISCAL YEAR CLOSED Jan. 1, 1896. DISTRIBUTION.—Mains, 12 miles. Taps, 450; made by city, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 8; owned by consumer; controlled by city. Use of meters optional with city; compulsory for manufacturers and motors. Hydrants, public, 112; private, 8. CONSUMPTION.—(Galls.) av., 245,000; max., 389,500; min., 185,000. PRESSURE.—Ordinary, 25 to 60 lbs.; fire, 100 lbs. One steam fire engine held in reserve. FINANCIAL.—Cost, $79,000. Bonded debt, $100,000, at 4%; due in 30 yrs., payable yearly. Expenses: Operating, $5,000. Revenue: Consumers, $7,000. Operating expenses met by income and excess goes to sinking fund. MANAGEMENT.—Supt., Wm. Lockett. Rept. by Ch. Pump. Engr., Chas. W. Tift, Aug. 14, 1896. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Covered reservoir, Feb. 8, 1894.

2. **AMERICUS,** Sumter Co. (6,398.) Built in '88 by city; enlarged in '90. SUPPLY.—Three artesian wells and springs, cased in brick and iron, led through 12-in. conduit to receiving basin a mile distant, thence pumped to tank. Also a creek near pumping station used in emergency. PUMPS.—Cap., 3,500,000 galls.; 2—1,000,000 Dean, one comp. and one high pressure; 1—1,500,000 Worthington comp non-cond. Wells are fitted with Bacon air lift pumps. Alabama mine run coal used; av. cost, $2.45 per short ton. RESERVOIRS.—Three receiving basins. TANK.—Cap., 190,368 galls.; iron; 30 × 36 ft., on brick tower 100 ft. high. DISTRIBUTION.—Mains, 10½ miles. Taps, 700; made by city, including service to curb. Services, ¾-in. galv. i.; paid for by consumer from curb. Meters, 45; owned mostly by consumer; yearly rental, $4.80, when owned by city. Hydrants, public, 76; private, 45. CONSUMPTION.—(Galls.) Max., 2,000,000; min., 1,000,000. PRESSURE.—Ordinary, 65 lbs. Two steam fire engines are owned but not used. FINANCIAL.—Bonded debt, $30,000; due, $2,000 yearly, '89 to 1917. MANAGEMENT.—Mayor, J. A. Hixon; Clk. and Treas., H. S. Davis; Supt., C. Wheatley. Rept. by Supt., Nov. 7, '96. SEWERS.—Has sanitary sewers.

3. **ATHENS,** Clarke Co. (8,639.) First supplied in '82-3 by Co.; present works built in '93 by city; put in operation Sept. 1. Engr., John W. Barnett. Contrs., Howard, Neely & Co. (In '82-3 Athens City Water-Works Co. built works; in '92, Co. assigned its contracts to the New York Water Supply Co., and in '93 shut off water. In '96 works were sold at receiver's sale and latter part of yr. work of taking up mains for sale to City of Eatonton, Ga., was begun. Press repts.) LEGAL DIFFICULTIES.—Co. tried to restrain city from building works, but courts decided adversely. SUPPLY.—Oconee River, by pumping. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. Coal used, av. cost, $2.65 per short ton. FILTERS.—Cap., 1,000,000 galls.; Warren. RESERVOIR.—Cap., 2,000,000 galls.; impounding. STAND-PIPE.—Cap., 176,000 galls.; 20 × 75 ft., on w. i. trestle 75 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 17½ miles. Taps, 450; made by consumer. Services, w. i. tarred; paid for by property owner or consumer. Meters, 30; owned and repaired by consumer; controlled by city. Use of meters compulsory for large consumers, manufacturers and stables. Co. can compel use of meters and any consumer may have one. Hydrants, public, 185; private, 8. CONSUMPTION.—(Galls.) av., 450,000; max., 650,000; min., 275,000. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $125,000. Bonded debt, $125,000, at 5%; one bond is retired annually for 30 yrs. Expenses: Operating, $7,000; int., $6,250. Revenue, Consumers, unmetered, $4,200; metered, $1,800. A tax of 13-100 of 1% is levied. MANAGEMENT.—Supt., W. L. Wood. Rept. by Supt., June 10, '96. SEWERS.—Has sanitary sewers. REFERENCES.—Eng. News, Jan. 3, '85; bonds declared void, Jan. 5, Feb. 9, '93; Warren filters, Jan. 4, '94, illus.

4. **ATLANTA,** Fulton Co. (65,533.) Old works built in '74-5 by city. New supply introduced in '92-93. Engr., R. M. Clayton. Consult. Engr., Rudolph Hering, N. Y. City. SUPPLY.—Chattahoochee River, pumping to storage reservoir, thence repumped direct. PUMPS.—Cap., 20,000,000 galls. at each station (pumping and repumping); 4—10,000,000 Holly-Gaskill hor. high duty. Bituminous coal used; av. cost, $1.70 per short ton. FILTERS.—Cap., 7,000,000 galls.; Hyatt (or New York) and New York. RESERVOIR.—Cap., 180,000,000 galls.; storage, three miles from city. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 80 miles; cost extensions met by appropriation. Taps, 6,266; made by city, including service to curb. Services, lead; paid for by consumer from curb. Meters, 6,200; owned by property owner; controlled and repaired by city. Use of meters compulsory for all consumers. Hydrants, public, 920. CONSUMPTION.—(Galls.) av., 4,541,334. New works, $566,107; old works, $262,000; total, $828,107 (press rept., Apr., '96). PRESSURE.—Ordinary, 60 lbs.; fire, 80 lbs. Steam fire engines are only used in case of failure of system. FINANCIAL.—Expenses: Operating, $54,117. Revenue: Consumers, $73,563. MANAGEMENT.—Prest., Geo. Hillyer; Secy., Cephas M. Brown; Supt., Park Woodward; Ch. Pump. Engr., J. B. Travis. Rept. by Supt., Aug. 25, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 27, '81; new supply from Chattahoochee River, May 26, '92; intake, May 28, '95, illus.

5. **AUGUSTA,** Richmond Co. (33,300.) Present works built in '59-61 by city; first supplied in '28 by Turknett Springs Water Co., whose works were abandoned Jan. 1, '92. SUPPLY.—Savannah River, through canal and settling basins, pumping direct and to tank. PUMPS.—Cap., 11,000,000 galls.; 2,000,000 Morris; 5,000,000 Wood; 1,000,000 Knowles; 3,000,000 Wothington comp. non-cond. Water power used. RESERVOIR.—Cap., 100,000,000 galls.; distributing. STAND-PIPE.—Cap., 24,700 galls.; steel; 10 × 42 ft., on tower 90 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 44 miles; cost extensions met by appropriations. Taps made by consumer for $3.50. Services, galv. i.; paid for by property owner. Meters, 62; owned and repaired by consumer; controlled by city. Use of meters optional with city; compulsory for public buildings, stables, etc. Hydrants, public, 385. CONSUMPTION.—(Galls.) av., 3,800,000. PRESSURE.—Ordinary, 40 lbs.; fire, 55 lbs. Steam fire engines are used. FINANCIAL.—(In '93.) Cost $500,000. Expenses: Operating, $4,962. Revenue: Consumers, $49,034. MANAGEMENT.—Rept. by Secy., J. S. Patterson. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 19, '81.

6. **BAINBRIDGE,** Decatur Co. (1,668.) Built in '82-6 by town. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Cap., 32,000 galls.; Knowles. TANK.—Cap., 32,000 galls.; 8 × 17 ft. DISTRIBUTION.—Taps, 200. Meters, 0. Hydrants, 20. CONSUMPTION.—(Galls.) av., 251,000. FINANCIAL.—Cost, $150,000. Expenses: Operating, $800. MANAGEMENT.—(In '96.) Mayor, A. L. Hawes; Clk., B. Nussbaum. NOTE.—Figures are those given in '90 Manual.

7. **BARNESVILLE,** Pike Co. (1,839.) Built in '93 by city. Engr., N. Wilson Davis, Atlanta. SUPPLY.—Spring (200 galls. per min.), pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Smith-Vaile. Coal used; av. cost, $2.35 per short ton. RESERVOIR.—Cap., 350,000 galls.; 1 mile from city on a hill. DISTRIBUTION.—Mains, 6 miles. Taps, 100; made by city for $3.00. Services, w. iron; paid for by city to curb. Meters, 2; owned by city; yearly rental, $4.00 for ¾-in. Use of meters optional with consumer. Hydrants, not given. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $20,000. Floating debt, $20,000, at 6%; bonded, $20,000, due 1918. Expenses: Operating, $800; int., $1,200. Revenue: Consumers, unmetered, $1,250; metered, $316; R. R. $300; City,

none. Deficits are met by tax. MANAGEMENT.—W. B. Smith; Secy., T. W. Cochran; Treas., J. B. Bankster. Rept. by Council, July 7. '96. SEWERS.—None.

8. **BRUNSWICK,** Glynn Co. (8,459.) Built in '86 by Brunswick Light & Water Co. Press rept., Apr. 2, '96, stated W. E. Burbage had been appointed temporary receiver. FRANCHISE.—20 yrs., after expiration of which city may purchase works, price to be settled by arbitration. Rates not subject to regulation by city. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 3,000,000 galls.; Worthington: 1,000,000 non-comp. high pressure; 2,000,000 comp. non-cond. TANK.—Cap., 112,600 galls., on tower. DISTRIBUTION.—Mains, 14 miles. Taps, 800. Meters, 0. Hydrants, 91. CONSUMPTION.—(Galls) av., 800,000. FINANCIAL.—Cost, $125,000. Cap. Stock: Authorized, $50,000; all paid-up. Bonded debt, $100,000: $50,000, at 7%; due 1907; $50,000, at 7%; due 1909. Expenses: Int., $12,000; taxes, $1,125. Revenue, $17,062. NOTE.—No official rept. since '90-1 Manual; Financial, except revenue, applies to water, gas and electric lights.

9. **CARTERSVILLE,** Bartow Co. (3,171.) Built in '89 by Cartersville Water Co. FRANCHISE.—30 yrs. SUPPLY.—Springs, on bank of Etowah River, 2 miles from city, pumping to tank. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington simple high pressure. Coal used; av. cost, $1.50 per short ton. TANK—Cap., 110,160 galls.; 25 × 80 ft., one tower 70 ft. high. DISTRIBUTION.—Mains, not given; cost extensions met by city funds. Taps, 225; made for $2. Services paid for by consumer. Meters, 3; owned, controlled and repaired by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 58. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Expenses: Operating, $1,000. MANAGEMENT.—Chn. Water Comrs., A. D. Gilbert; City Treas., J. H. Vivian. Ch. Pump. Engr., N. C. Newhouse. Rept. by J. E. Wikle, Sept. 1, '96. SEWERS.—None.

10. **CEDARTOWN,** Polk Co. (1,625.) Built in '92 by city. Contrs., James & Co., Chattanooga. SUPPLY.—Pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000. Above from press rept., giving account of contracts let in '92. Press rept., Feb. 6, '96, confirmed existence of works and indicated that they are run in connection with electric light plant.

11. **COLUMBUS,** Muscogee Co. (17,303.) Built in '82 by Columbus Water-Works Co. FRANCHISE.—15 yrs. from '82; provides for purchase of works by city after 15 yrs., price to be set by three comrs. Co. is exempt from local taxes in consideration of water supplied to city. City to pay $8,000. LEGAL DIFFICULTIES.—City repudiated contract because not ratified by a city vote. SUPPLY.—Creek and springs, three miles from city, by gravity, through a 12-in. main. RESERVOIR.—Cap., 140,000,000 galls., two; one impounding and storage and one distributing. Cap. has been reduced greatly, owing to an influx of sand. STAND-PIPE.—Cap., 305,000 galls.; iron; 20 × 130 ft. FISCAL YEAR CLOSED Feb. 28. DISTRIBUTION.—Mains, 20 miles; cost extensions met by sale of bonds. Taps, 1,085; made by Co. free. Services, galv. i.; paid for by Co. to curb. Meters, 900; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for all consumers. Hydrants, public, 102; private, 43. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 40 lbs. City has 3 steam fire engines. FINANCIAL.—Cap. Stock: Authorized, $150,000; paid no div'd in '95. Bonded debt, $365,000, at 5%. Expenses, $24,562: Operating, $5,512; int., $18,250; taxes, $800. Revenue, $27,248: Consumers, unmetered, $3,003; metered, $16,140; City, fire protection, $7,748; sewer flushing, $208; street sprinkling and public buildings, none; other purposes, $149. MANAGEMENT.—Prest., H. H. Epping; Secy. and Treas., J. G. Beasley; Supt., office vacant. Rept. by Secy., June 6, '96. PROJECTED IMPROVEMENTS.—Stand-pipe, larger mains to replace the present ones, increased pressure, cleaning of storage reservoir, removal of all dead ends. Co. asks in return that its old contract be made of "full force and effect" and is now awaiting decision of city. NOTE.—Feb. 27, '97, R. L. Johnson, Supt. Pub. Wks., rept. that at election on Feb. 23, '97, a $290,000 bond issue for city works was lost; failing the third time to receive two-thirds majority of registered voters, although a plurality was secured each time; also that 20 × 120 ft. steel stand-pipe was under construction for high service in Rose Hill annex to which water will be pumped. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 7, '84.

12. **CORDELE,** Dooly Co. (1,578.) Built in '91 by city; put in operation Oct. 13, SUPPLY.—Springs, ½ mile from city, pumping direct. PUMPS.—Cap., 300,000 galls.; two Knowles dup. Wood used; av. cost, $2.50 per day. DISTRIBUTION.—Taps, 100; made by city. Services paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 21. PRESSURE.—Ordinary, 100 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $14,000, at 6%. MANAGEMENT.—Treas., R. E. Harris; Supt., F. M. Floyd. Rept. by Supt., June 6, '96. SEWERS.—Has sanitary sewers.

13. **CUTHBERT,** Randolph Co. (2,828.) Built by city; put in operation in Feb., '96. Engrs., Mable & Sullivan, Atlanta. Contrs., Felton & Lyttle, Lexington, Ky. SUPPLY.—Small streams, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Smith-Vaile. Wood used; av. cost, $1.88 per cord; ¾ cord used daily. TANK.—Cap., 120,000 galls.; steel; 20 × 50 ft., on tower, 70 ft. high. Contrs., Walsh & Weidner, Chattanooga, Tenn. DISTRIBUTION.—Mains, 8 miles; cost extensions met by direct taxation. Taps,

105; made by city at $3 for ½-in.; $3.50 for ⅝ or ¾-in.; $5.00 for 1-in., including service to curb. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 64. PRESSURE.—Ordinary, 60 lbs.; fire, direct pressure from pumps. City owns a steam fire engine. FINANCIAL.—Cost, $36,000. Bonded debt, $36,000, at 6%; due 1920. Sinking Fund, 1-25 of amt. of bond issue; invested in city warrants and improvements at 7%. Expenses: Operating, $800; int., $2,160. MANAGEMENT.—City Treas., G. D. Webb; Supt. and Ch. Pump. Engr., Guy P. Felton. Rept. by Robt. L. Maye, Mayor, Aug. 7, '96. SEWERS.—None.

14. **DALTON,** Whitfield Co. (3,046.) Built in '88 by city. SUPPLY.—Springs, pumping from reservoir to stand-pipe. PUMPS.—Cap., 1,000,000 galls. 2—500,000 Gordon dup. Nut and slack coal used; av. cost, $1.50 per short ton at works. RESERVOIR.—Cap., 116,800 galls. STAND-PIPE.—Cap., 188,000 galls.; steel; 20 × 80 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by appropriation. Taps, 312; made by city for $3 per tap. Services, w. i.; paid for by consumer or owner of property. Meters: 2; owned by consumer; controlled by city; repairs paid by owner. Use of meters compulsory for R. R., court-house and jail. City can compel the use of meters and any consumer may have one. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 275,000. PRESSURE. — Ordinary, 65 lbs. FINANCIAL. — Cost, $37,500. Bonded debt, $30,000, at 5%; due 1918. Sinking Fund: $3,500; invested at 7%. Expenses: Operating, $1,475; int., $1,500. Revenue, $3,000. MANAGEMENT.—Prest. of Comrs., Geo. W. Hamilton. Rept. by Supt., C. G. Spencer, Aug. 5, '96. SEWERS.—None.

15. **DAWSON,** Terrell Co. (2,284.) Built in '91 by Dawson Water-Works Co.; put in operation in Aug. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. SUPPLY.—Stream, pumping to stand-pipe. PUMPS.—Cap., 1,050,000 galls.; 750,000 and 300,000 Worthington simple high pressure. Wood used. TANK.—Cap., 91,800 galls.; 25 × 25 ft., on trestle. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5 miles; w. i. and cement pipe. Taps, 132; made for $4. Services, lead and iron; paid for by consumer. Meters: 14; owned, controlled and repaired by Co. Use of meters optional with Co. Hydrants, public, 50. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Treas., J. W. Hawley; Secy., H. Bayard Hodge, 1319 Filbert St., Philadelphia; Supt., J. A. Horsley. Rept. by Am. Pipe Mfg. Co., Philadelphia, June 8, '96.

P 1. **DOUGLASVILLE,** Douglas Co. (863.) Bonds for works have been voted but not sold. No Engr. selected. Supply, creek, one mile distant, pumping to stand-pipe. Est. cost, $15,000. Rept. by L. C. Upshow, Committeeman, Nov. 16, '96.

16. **DUBLIN,** Laurens Co. (862.) Under construction in '96 by city. Engr., J. S. Moore, Atlanta. Contrs., Walton & Wagner, Rome. SUPPLY.—Artesian well, 8 ins. diam., 300 ft. deep, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Worthington comp. non-cond. Wood used. DISTRIBUTION.—Mains, 4 miles. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, est., $23,000. Bonded debt, $30,000. MANAGEMENT.—Comrs.; Chn., K. H. Walker. Rept. by Chn., Aug. 15, '96. SEWERS.—None.

17. **EAST ROME** (P. O. Rome), Floyd Co. (514.) Built in '96 by town. Contrs., Jas. McGuire and W. W. Walters. SUPPLY.—Rome City Water-Works, through 6-in. meter for 12½ cts. per 1,000 galls. DISTRIBUTION.—Mains, 1½ miles. Taps, made by town for $6. Services, paid for by consumer. Meters, not given; owned and controlled by town; repairs paid by consumer. Use of meters optional with consumer. Hydrants, public, 10. FINANCIAL.—Cost, $3,000. No debt. MANAGEMENT.—Comrs.; Chn., C. Terhune. Rept. by Prest., Aug. 7, '96. SEWERS.—None.

18. **EATONTON,** Putnam Co. (1,682.) Contract awarded in Nov., '96, to Walton & Wagner, Rome. Engrs., Moore & McCrary, Atlanta. SUPPLY.—Creek, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000. STAND-PIPE.—Cap., about 100,000 galls.; 12 × 120 ft. DISTRIBUTION.—Mains, 5 miles. Hydrants, 40. FINANCIAL.—Est. cost, $25,000; contract price, $23,843. Press rept., Feb. 17, '97, stated $15,000 bonds had been sold. MANAGEMENT.—Mayor W. H. Hearn. Rept. by Secy. and Treas., C. M. Davis, latter part of '96; some of the figures taken from call for bids, and therefore subject to amendment.

P 2. **FITZGERALD,** Irwin Co. (Not given.) Specifications for works are being prepared. Supply, tubular wells, pumping by 2—500,000 dup. high pressure pumps to 12 × 120-ft. steel stand-pipe. About 4 miles mains and 40 hydrants. Rept. by Mayor, C. C. Goodnow, Feb. 2, '97.

P 3. **FORSYTH,** Monroe Co. (920.) Contract calling for completion of works by Apr., '97, held by J. N. Hazlehurst & Co., Atlanta. City has sold bonds, but construction has not started; awaiting modifications in pump specifications. Rept. by Contr., Dec. 9, '96. Press rept. indicates that contract was let in May, '96, and that Stilwell-Bierce & Smith-Valle pumps and a stand-pipe will be included in plant.

19. **FORT GAINES,** Clay Co. (1,097.) Built in '77-8 by town. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 216,000 galls.; Deane. RESERVOIRS.—Cap., 100,000 galls.; 140 ft. above town. STAND-PIPE.—Cap., 21,000 galls. DISTRIBUTION.—Hydrants, public, 8. CONSUMPTION.—(Galls.), av., 50,000. FINANCIAL.—(In '88.) Cost, $2,000. Debt, $300. Expenses: Operating, $550. Revenue, $300. MANAGEMENT.—Rept. by T. M. Brown, Cy. Clk., June 6, '96. SEWERS.—None.

20. **FORT VALLEY**, Houston Co. (1,752.) Built in '94 by city. Engr., J. W. Wilcox, Macon. SUPPLY.—Springs, collected in well and pumped to tank. PUMPS.—Smith Vaile comp dup. Wood used. TANK.—Cap., 47,600 galls.; 18 x 25 ft., on steel tower, 80 ft. high. DISTRIBUTION.—Mains, 5 miles. Taps, 100; made by city for $2.50. Services, iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 16; private, 2. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary, 45 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $25,000. Expenses: Operating, $900. MANAGEMENT.—Prest., C. G. Gray; Secy., F. S. Murray. Rept. by F. O. Miller.

21. **GAINESVILLE**, Hall Co. (3,202.) Built in '90-1 by city; put in operation Jan. 10. SUPPLY.—Mountain stream, pumping to stand-pipe. PUMP.—Cap., 750,000 galls.; Deane dup. FILTER.—Gravel and sand. STAND-PIPE.—Cap., 120,000 galls.; iron; 16 x 80 ft., enclosed by brick wall. DISTRIBUTION.—Mains, 6¾ miles. Services, ¾-in. galv. i. Hydrants, public, 37. PRESSURE.—Ordinary, 70 lbs.; fire, 90-100 lbs. FINANCIAL.—Cost, $31,822. Bonded debt, $30,000, at 5 and 6%. Expenses: Operating, $600. MANAGEMENT.—Supt., R. D. Mitchell. Rept. by W. D. Whitchel, Sept. 29, '96.

22. **GRIFFIN**, Spalding Co. (4,508.) Now owned by city. Built in '91 by Griffin Water-Works Co. Engr. and Contr., W. A. Robinson, Macon. (In Mar., '93, Receiver sold plant at auction to creditors at upset price of $24,000. Feb. 1, '94, city bought works for $25,250, some improvements having been made since auction sale. Press rept.) SUPPLY.—Spring, also a reserve from stream, pumping to tank. PUMPS.—Blake: one dup. comp.; one high pressure. Av. cost of coal, $2.55 per short ton. RESERVOIRS.—Cap., 400,000 galls.; impounding, 100,000 and 300,000. TANK.—Cap., 275,000 galls.; steel, 35 x 50 ft., conical bottom; on 6 steel posts; tower 70 ft. high. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 8.5 miles; cost extensions met by appropriations. Taps, 120; made by city for $3, including service to curb. Services, iron; paid for by consumer. Meters: 6; owned, controlled and repaired by city. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 52; private, 8. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. Steam engines are used at large fires. FINANCIAL.—Cost, $38,000. Expenses, Operating, $3,000. Revenue, Consumers, unmetered, $2,000; metered, $900. MANAGEMENT.—Ch. Pump. Engr., H. Miller. Rept. by Supt., W. K. Howard, July 22, '96. SEWERS.—Has partial system of storm sewers.

P 4. **HAWKINSVILLE**, Pulaski Co. (1,755.) Bids for constructing water and light were to have been received Feb. 17, '97, but matter was postponed "until further notice." Engr., J. L. Ludlow, Winston. Supply, artesian wells, pumping to stand-pipe. Est. cost, $30,000. Bonds had not been sold Dec. 14, '96. Mayor, S. A. Way. Repts. by Engr., Dec. 14, '96, and Feb. 9, '97.

P 5. **JACKSON**, Butts Co. (922.) Mass meeting to discuss works has been held. Rept. by J. G. McDonald, Dec. 14, '96.

—. **KENSINGTON**, Walker Co. (Not given.) Works described in '90-1 Manual as under construction have been abandoned.

23. **LA GRANGE**, Troup Co. (3,090.) Built in '92 by La Grange Water-Works Co.; put in operation June, '92. Engrs. and Contrs., American Pipe Mfg. Co., Phila., Pa. SUPPLY.—Creek, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Barr simple dup. Bituminous coal used. FILTERS.—Cap., 250,000 galls. National (New York.) STAND-PIPE.—Cap., 132,200 galls.; iron, 15 x 100 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7 miles, w. i. and cement pipe. Taps, 74; made for $4. Services, iron and lead; paid for by consumer. Hydrants, public, 79. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., E. F. Partridge; Secy., H. Bayard Hodge, 1319 Filbert St., Philadelphia; Treas., J. W. Hawley; Supt., G. S. Hanson. Rept. by American Pipe Mfg. Co., Philadelphia, June 8, '96.

24. **LINDALE**, Floyd Co. (Est., 1,200.) Built in '95 by Massachusetts Mills in Georgia. Engr., A. W. Hunking. These works were constructed in conjunction with the building of the mill and village, exclusive ownership of which is vested in Mass. mills in Georgia. SUPPLY.—Spring, pumping to reservoir by water power. PUMP.—Cap., 250,000 galls.; 8 x 10 Goulds triplex, driven by water wheel. RESERVOIR.—Cap., 652,000 galls. DISTRIBUTION.—Mains, 1 mile, 8 to 4-in. Taps, 75. Services, ¾-in. iron. Meters, 0. Hydrants, public, 20. CONSUMPTION.—Unknown. PRESSURE.—(In mill yard), 97 lbs. FINANCIAL.—Not separated from other mill accounts. MANAGEMENT.—Rept. by A. W. Hunking, Jan. 18, '97. SEWERS.—None.

25. **MACON**, Bibb Co. (22,746.) First supplied in '67; present works built in '81 by Macon Gaslight & Water Co. FRANCHISE.—Does not provide for purchase of works by city. Maximum rates are fixed in franchise. LEGAL DIFFICULTIES.—See Note, below. SUPPLY.—Springs, pumping to reservoir and tank. PUMPS.—Cap., 8,750,000 (?) galls.; Worthington: 3,000,000 and 1,000,000 comp. non-cond.; 750,000 and 2—2,000,000 simple high pressure. (Rept. by makers, Jan., '97; not stated whether all now in use.) FILTERS.—Warren, Jewell and New York. RESERVOIR.—Cap., 2,500,000 galls. TANK.—Cap., 75,000 galls. DISTRIBUTION.—Mains, 32.5 miles. Taps, 2,273. Meters, 65. Hydrants, 200. CONSUMPTION.—(Galls.) av., 1,647,000. FINANCIAL.—Cost, $356,473. REFERENCES.—Eng. News, Oct. 28, '82; Warren filters, Jan.

4, '94, illus.; Jewell filters, May 28, '96. NOTE.—Above information from '90-1 Manual. Legal difficulties regarding purity of water were set forth in press repts. in '91. Feb. 22, '92, Co. rept. that new 20-yr. contract had just been secured from city. In '93, further legal difficulties were rept. Further press repts. indicate that in '96 works were in hands of Receiver, T. D. Kinsley, and that early in '97 a plan of reorganization was under way.

26. **MARIETTA,** Cobb Co. (3,384.) Built in '96 by Marietta Paper Mfg. Co. Engr., O. C. Gillett; Contrs., Felton & Sullivan, Atlanta. FRANCHISE.—Perpetual; "no limit to purchase." Rates are required by franchise to be as low as in other cities of like size and location. Co. not exempt from local taxes. City to pay $600 for 40 hydrants for 7 months; temporary contract expired with '96. SUPPLY.—Springs, pumping to stand-pipe from reservoir. PUMPS.—Cap., 1,350,000 galls.; two Stilwell-Bierce & Smith-Valle; one 1,000,000; one 350,000. RESERVOIR.—Cap., 15,000,000 galls. STAND-PIPE. Cap., 265,000 galls.; 30 x 50 ft., on hill 89 ft. above city. Contrs., Walsh & Weidener, Chattanooga, Tenn. DISTRIBUTION.—Mains, 8½ miles, 10 and 8-in. c. i. Taps, 80; made by Co. for $7, including service to curb. Services, w i.; paid for by consumer from curb. Meters: 4; owned, controlled and repaired by Co. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants: public, 42; private, 2. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $45,000 to $50,000. Cap. Stock: Authorized, $150,000; all paid-up. No debt. Bonds: Authorized, $75,000; none issued; are considering selling bonds. Above capital includes two paper mills, cotton batting and waste mill. MANAGEMENT.—Marietta Paper Mfg. Co. Prest., Saxon A. Anderson; Vice-Prest., Dr. Lewe Sessions; Secy. and Treas., Moultrie M. Sessions. Rept. by Secy., Dec. 14, '96. SEWERS.—None.

27. **MILLEDGEVILLE,** Baldwin Co. (3,322.) Built in '93 by Milledgeville Water Co.; put in operation July, '93. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia, Pa. SUPPLY.—Stream, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Deane dup. Bituminous coal used. FILTERS.—Cap., 500,000 galls.; New York. STAND-PIPE.—Cap., 152,750 galls.; 20 x 65 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 6 miles; w. i. and cement pipe. Taps, 154; made for $4. Services, iron and lead; paid for by consumer. Meters: 7; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 71. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., E. F. Partridge; Secy., H. Bayard Hodge, 1319 Filbert St., Philadelphia, Pa.; Treas., J. W. Hawley; Supt., J. F. Wilson. Rept. by Am. Pipe Mfg. Co., Philadelphia, June 8, '96.

F 1, P 6. **MONTEZUMA,** Macon Co. (706.) Artesian well, flowing 50 galls. per min., discharges into 50,000-gall. reservoir, used for fire protection. City Council is figuring on water-works. Unsigned rept., Aug., '96.

28. **NEWNAN,** Coweta Co. (2,859.) Built in '93 by city. Engr., N. Wilson Davis, Atlanta; Contrs., Howard Neely & J. G. Lee. SUPPLY.—Streams, by pumping from receiving reservoir, direct to mains. PUMPS.—Cap., 750,000 galls.; Smith-Valle. RESERVOIR.—Cap., 1,000,000 galls. STAND-PIPE.—Originally contemplated as part of system; bids for 20 x 120 ft. pipe were to be received Mar. 27, '94. DISTRIBUTION.—Hydrants, 53, originally planned for. FINANCIAL.—Cost $35,000. Bonded debt, $35,000 or more. Above information from press reports, including interview with Engr. after completion of works, and official advertisements in '94, hence subject to correction. Dec., '96, I. N. Orr (who was Mayor when bids were invited) rept. that "works here are owned by city."

P 7. **PERRY,** Houston Co. (665.) Oct. 10, '96, election was to be held on building works, city having been enjoined from building. Rept. by Clk. Cy. Council, Sept., '96. Press repts. stated that contract was let in Apr., '96, to J. S. Moore & Co., Atlanta, for $7,400, but court declared bond election illegal. SUPPLY.—Artesian well.

29. **QUITMAN,** Brooks Co. (1,868.) Built in '95 by city; put in operation May 10. Engrs., Stillwell-Bierce & Smith-Vaile Co., Dayton, O. SUPPLY.—Well, 26 ft. deep, pumping direct. PUMPS.—Cap., 2,880,000 galls.; 2—1,440,000 Stilwell-Bierce & Smith-Vaile Co. A Pohle air lift pump is used; air compressor, 8 x 12-in. Rand. Pine wood used; av. cost, $1.44 per cord, delivered. RESERVOIR.—Cap., 65,000 galls.; distributing located at pump-house. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by city. Taps, 50; made by consumer. Services, iron; paid for by consumer. Meters, none. Use of meters optional with consumer. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 95,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. One steam fire engine is owned, but seldom used. FINANCIAL.—Cost, $15,000. Bonded debt, $20,000 at 6%. Expenses, Operating, $1,000. MANAGEMENT.—Mayor, S. G. Bennett; Chn., G. W. Averett; Treas., M. C. Wade; Supt., F. M. Silvers. Rept. by Supt., Sept. 18, '96. SEWERS.—Has storm sewers only.

D 1. **RISING FAWN,** Dade Co. (927.) Built in '90 by G. W. Cureton. Supply, springs, by gravity, from 250,000-gall. reservoir. Mains, 3-in., 3 miles. Pressure, 125 lbs. Cost, $10,000. MANAGEMENT.—Owner, Geo. W. Cureton.

30. **ROME,** Floyd Co. (6,957.) Built in '71 by city; sells water by meter to East Rome. SUPPLY.—Oostanaula River, pumping to distributing reservoir. PUMPS.—Cap.,

4,000,000 galls.; 2—2,000,000-gall. Laidlaw. Tennessee bituminous coal used; av. cost, $1.50 per short ton. RESERVOIRS.—Cap., 3,000,000 galls.; distributing. STAND-PIPE.—Cap., 230,000 galls; 25 × 63 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by income. Taps, 800; made by city for $3. Services, lead and iron; paid for by property owner. Meters, 21; owned and controlled by property owner. City can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 5. CONSUMPTION.—(Galls.) av., 1,300,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $220,000. Bonded debt, $98,000, due 1906. Sinking Fund, $5,000. Expenses: Operating, $5,600. Revenue, $9,500. MANAGEMENT.—Prest., J. T. Warlick; Secy. and Treas., J. T. Moore; Supt., James McGuire; Ch. Pump. Engr., Wm. Chambers. Rept. by Secy., Aug. 29, '96. SEWERS.—Has partial system of storm sewers. REFERENCE.—Eng. News, Oct. 1, '81.

81. **SAVANNAH,** Chatham Co. (43,189.) First works built by city in '53-4. Present supply introduced in '92. Engr., T. T. Johnson, Chicago, Ill. SUPPLY.—13 artesian wells, 8,000,000 galls., flowing into collecting gallery, thence pumping direct. PUMPS.—Cap., 24,000,000 galls.; 2—12,000,000 Holly-Gaskill hor. high duty. Bituminous coal used; av. cost, $2.90 per short ton. TANK.—Cap., 185,000 galls.; 36 × 30 ft., on brick foundation. Not in use, but kept in order. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 45½ miles; cost extensions met by appropriations. Taps, 6,500; made by water-works for $3. Services, lead and iron; paid for by consumer. Meters: 200; owned, controlled and repaired by city. Use of meters compulsory for all large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 470; private, 24. CONSUMPTION.—(Galls.) av., 6,000,000; max., 6,250,000; min., 5,750,000. City is now metering services one street at a time. PRESSURE.—Ordinary, 50 lbs. fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $998,406. Expenses: Operating, $29,436. Revenue, $75,347. MANAGEMENT.—Prest. Bd. of Comrs., Jas. M. Dixon; Supt., H. M. Lofton. Rept. by Supt., June 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES—Eng. News, Nov 12, '81; artesian wells, June 8, with inset; July 6, '93, illus.

P 8. **SUMMERVILLE** (P. O., Augusta), Richmond Co. (Not given.) Village proposes to build water-works and sewers. Address Bryan Cumming, Augusta. Rept. by A. H. Davidson, City Engr. of Augusta, Jan. 9, '97. Press repts., in '96, stated water might be bought from Augusta; also that W. Kiersted, Kansas City, was making estimates for works in Dec., '96.

82. **TALLAPOOSA,** Haralson Co. (1,699.) Built in '90-1 by Tallapoosa Water Co.; put in operation Feb. 19. FRANCHISE.—30 yrs. from '90; provides for purchase of works by city any time after 5 yrs. SUPPLY.—Springs, pumping from impounding reservoir to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. non-cond. Wood used; av. cost, $5 per cord. RESERVOIR.—Cap., 50,000 galls.; impounding. STAND-PIPE.—Cap., 235,000 galls.; iron; 20 × 100 ft., on stone foundation. DISTRIBUTION.—Mains, 5 miles; cost extensions met by bonds. Taps, 172; made by Co. for $5. Services, lead; paid for by consumer. Meters: 2; owned by Co. Use of meters optional with consumer; compulsory for manufacturers. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 70 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $58,375. Cap. Stock: Authorized, $225,000. Bonded debt, $63,000, at 6%; due 1920. Expenses: Operating, $1,810. Revenue: Consumers, unmetered, $2,650; City, fire protection, $2,850. MANAGEMENT.—Prest., John M. Crane; Secy. and Treas., Geo. T. Keith, 11 Wall St., N. Y. City; Supt., M. A. Greene. Rept. by Contrs., Woltmann, Keith & Co., 11 Wall St., N. Y. City, Nov. 1, '96. SEWERS.—None.

83. **THOMASVILLE,** Thomas Co. (5,514.) Built in '88 by city; new works put in operation April 7, '95. Engrs. and Contrs., Frictionless Metal Co., Richmond, Va. SUPPLY.—Artesian wells, fitted with Bacon, and Thompson & Miller air lifts. PUMPS.—Cap., 864,000 galls.; Knowles. Wood used; av. cost, $1.75 per cord. RESERVOIR.—Cap., 60,000 galls.; storage. STAND-PIPE.—Cap., 367,200 galls.; iron; 25 × 100 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 8 miles. Taps, made by city at $6 for ½-in.; $8 for ¾-in.; $9 for 1-in. Services, galv. i.; paid for by city. Meters, owned and repaired by consumer; controlled by city. Use of meters compulsory for sprinklers. City can compel use of meters and any consumer may have one. Hydrants, public, 102. Consumption is about doubled during winter. PRESSURE.—Ordinary, 52 lbs.; fire, 140 lbs. Fire engines seldom used. FINANCIAL.—Expenses: Operating, $6,960. MANAGEMENT.—Chn., Wm. Miller; Supt., E. O. Thompson. Rept. June 6, '96. PROJECTED IMPROVEMENTS.—Additional compressor. SEWERS.—Partial system of sanitary sewers. REFERENCES.—Stand-pipe failure, Dec. 10, '87; Oct. 6, '88; Apr. 26, '94, illus.

D 2. **TYBEE,** Chatham Co. (Est., 500.) Built in '89 by Tybee Artesian Water, Ice & Lighting Co., chiefly to supply summer resort. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Windmill and Delamater-Rider hot air engine. TANKS.—Cypress; Cap., 37,000 galls.; two, 25,000 and 12,000; on wooden towers 27 ft. high. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 3 miles; 1, 2, 3 and 4-in. Taps, made by Co., free. Services, iron; paid for by property owner. Meters, 0. CONSUMPTION.—(Galls.) av., 25,000. FINANCIAL.—Cap. Stock: Authorized, $5,000; all paid-up.

MANAGEMENT.—Prest., Wm. Kehoe; Secy. and Treas., Robt. P. Lovell, Savannah; Supt., John G. Butler. Rept. by Secy., Aug. 10, '96. PROJECTED IMPROVEMENTS.—Additional pump. SEWERS.—None.

34. **VALDOSTA,** Lowndes Co. (2,854.) Built in '94 by city; put in operation July 20. SUPPLY.—Well, 525 ft. dup., by pumping. PUMP.—Cap., 300,000 galls.; Pohle air lift.; 8 × 12-in. Rand air compressor. RESERVOIR.—Cap., 75,000 galls. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by general receipts of city. Taps, 175; made by city; ¾-in. for $5. Services, iron; paid for by owner. Meters: 7; owned, controlled and repairs paid by city. Use of meters compulsory for fans, sprays, fountains, etc. City can compel use of meters and any consumer may have one. Hydrants, private, 3. CONSUMPTION.—(Galls.) av., 150,000; max., 230,000; min., 120,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $30,000. Bonded debt, $45,000, at 6%; due 1924. Sinking Fund: $1,000 each year. Expenses: Operating, $2,500; int., $2,750; taxes, $8,700 (?). Revenue: Consumers, unmetered, $1,800; metered, $100. Deficits to amount of int. on debt, ($2,750) are met by taxation. MANAGEMENT.—Rept. by Marcy Ashley, June 22, '96. SEWERS.—None.

D 3. **VIENNA,** Dooly Co. (536.) Built in '95 by city; put in operation April 1. Supply, artesian well, by pumping. Deane dup. pump. Wood used as fuel. Mains, 2 miles; cost extensions met by city. Taps made by consumer. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with city. Pressure, ordinary, 40 lbs. Cost, $2,500. No debt. Expenses: Operating, $500. Revenue: Public buildings, $60 per mo.; other purposes, $120, from R. R. Deficits of about $250 per yr. are met by general taxation. Rept. by B. P. Howell, Aug. 21, '96.

35. **WAYCROSS,** Ware Co. (3,864.) Built in '93 by city; put in operation in Oct. Engr., H. W. Reed. Contr., E. F. Joyce. SUPPLY.—Two artesian wells, pumping to stand-pipe. PUMP.—Cap., 1,100,000 galls.; Bacon air lift. Wood used. RESERVOIR.—Cap., 34,000 galls. STAND-PIPE.—Cap., 287,200 galls.; iron; 20 × 120 ft. FISCAL YEAR CLOSED Jan. 2. DISTRIBUTION.—Mains, 8 miles; cost extensions met by bonds and appropriations. Taps, 240; made by city at $5 for ½-in.; $6 for ¾-in.; $7 for 1-in. Meters: 2; owned and repaired by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 64; private, 1. CONSUMPTION.—(Galls.) av., 205,000; max., 300,000; min., 175,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $43,000. Bonded debt, $30,000, at 6%; due 1920. Sinking Fund: $2,200; loaned at 8%. Expenses: Operating, $2,100. Revenue: Consumers, unmetered, $1,900; metered, $200. Deficits are met by tax levy of 2½ mills. MANAGEMENT.—Rept. by Supt., B. D. Finn, June 24, '96. SEWERS.—Has sanitary and storm sewers.

36. **WEST POINT,** Troup Co. (1,254.) Expected to be completed by Jan. 15, '97. Engr., Roy Dallis, La Grange. Contrs., M. F. Sullivan & Co., Atlanta. Since the contract was awarded the city has contracted to furnish 500,000 galls. daily to Lanett Cotton Mills; additional mains for this will make the whole plant cost about $22,000, and city has advertised for a bond election to complete the plant. SUPPLY.—Creek, ½ mile north of city, by gravity through filters, thence pumping to reservoir and direct in case of fire. PUMP.—Cap., 750,000 galls. Smith-Vaile, dup. Av. cost of coal used, $2.25 per short ton. FILTERS.—Cap., 1,000,000 galls.; two gravity, built of steel, one filled with coarse gravel and sand; other with charcoal and fine sand; water flows through both. RESERVOIR.—Distributing, "on site of Fort Tyler," 185 ft. above and ½ mile from city. DISTRIBUTION.—Mains, 5½ miles. Hydrants, public, 36. PRESSURE.—Ordinary, 55 lbs. One steam fire engine is used. FINANCIAL.—Bonded debt, $20,000, at 6%. MANAGEMENT.—Mayor, J. J. Smith; City Clerk, T. J. Andrews. Rept. by Roy Dallis, Dec. 14, '96. PROJECTED IMPROVEMENTS.—Addition of pump and boiler; no steps taken as yet. SEWERS.—None.

——? **WRIGHTSVILLE,** Johnson Co. (910.) Dec., '96, R. B. Bryan, Clk. and Treas., rept., "we have all the works we need at present;" also citizen rept. that there were works, with J. M. A. Crawford, Supt. July 10, '91, town voted $5,000 for works and it was rept. that contracts were to be let at once.

FLORIDA.

1 **BARTOW,** Polk Co. (1,886.) Built in '94 by city; put in operation in Jan. Engrs. and Contrs., Howe Pump & Engine Co., Indianapolis, Ind. SUPPLY.—6-in. artesian well, pumping to tank. PUMP.—Cap., 432,000 galls.; Howe, operated by 20-HP. Foos gasoline engine. TANK.—Cap., 50,000 galls.; iron; on iron trestle 75 ft. high. DISTRIBUTION.—Mains, 3 miles. Taps, 130; made by city. Services, galv. i.; paid for by city. City can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 12,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $15,000 in '94. Expenses: Operating, $500. MANAGEMENT.—Supt., C. E. Reed. Rept. by Supt., Nov. 23, '96. SEWERS.—None.

2. **CRESCENT CITY,** Putnam Co. (554.) Built in '94 by Miller & Cash. Engr., C. H. Cash. FRANCHISE.—10 yrs. from 1895. Co. is exempt from local taxes. SUPPLY.—Artesian well, drives an overshot water wheel 8 ft. in diam. 8 ft. broad, which pumps the water to a tank. PUMPS.—Cap., not given; Knowles dup., 8 × 6 × 12. TANK.—Cap., 21,000 galls.; steel tower. DISTRIBUTION.—Mains, 1½ miles. Taps, 28; made by owner. Services, galv. i.; paid for by owner. Hydrants, public, 7; private, 14. CONSUMPTION.—(Galls.) av., 3,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $7,000. Expenses: Operating, $600. Revenue: City, fire protection, $405. Free water for public drinking fountain. MANAGEMENT.—Ch. Pump. Engr., C. H. Cash. PROJECTED IMPROVEMENTS.—Additional 6-in. well for fire service. SEWERS.—None.

3. **DE LAND,** Volusia Co. (1,113.) Built in '93 by city; put in operation in Mar. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Pumping to tank. PUMPS.—Cap., 425,000 galls.; Smith Vaile dup. TANK.—Cap., 40,000 galls.; steel, on 70-ft. steel tower. DISTRIBUTION.—Mains, ½ mile. Hydrants, 5. PRESSURE.—Ordinary, 35 lbs.; fire, 100 lbs. FINANCIAL.—Cost (?), $9,000. MANAGEMENT.—Fire and Water Com. Rept. by Contrs., Feb. 15, '97, for works as they stood at completion.

4. **FERNANDINA,** Nassau Co. (2,803.) Built in '89 by city. SUPPLY.—8-in. artesian well, 717 ft. deep, pumping to tank. Dy. cap. of well, 1,243,000 galls. PUMPS.—Cap., 1,500,000 galls.; Laidlaw-Dunn-Gordon comp. cond. TANK.—Cap., 110,160 galls.; 25 × 30 ft., on tower 125 ft. high. FISCAL YEAR CLOSED July 15. DISTRIBUTION.—Mains, 4 miles. Taps, 250. FINANCIAL.—Bonded debt, $40,000, at 6%; payable 1909. Expenses: Operating, $2,180; int., $1,800. Revenue, $823. MANAGEMENT.—Board of Pub. Wks. Chn., G. Starke; City Clk., Geo. S. Roux; Engr. and Supt., Chas. Williams. Rept. by Secy., Sept. 29, '96.

5. **GAINESVILLE,** Alachua Co. (2,790.) Built in '94 (?) by city. SUPPLY.—By pumping. PUMPS.—Cap., 250,000 galls.; Laidlaw-Dunn-Gordon (rept. by maker). MANAGEMENT.—Supt. (press rept., Apr. 13, '96), L. T. Roux.

D 1. **GREEN COVE SPRINGS,** Clay Co. (1,106.) Built by N. B. Ines for domestic use. Franchise provides for purchase of works by city at any time. Rates are not fixed in franchise nor subject to regulation by city. Prop. is not exempt from local taxes. Supply, artesian wells, by natural pressure. Taps made by owner of works. Services, iron. Meters, 0; owner cannot compel their use. Rept. by owner, Aug. 16, '96.

6. **JACKSONVILLE,** Duval Co. (17,201.) Built in '80 by city. SUPPLY.—Artesian wells, pumping direct (see below). PUMPS.—Cap., 4,500,000 galls.; Worthington comp., 1,500,000 and 3,000,000 (see below). Wood used; av. cost, $1.75 per cord. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by earnings. Taps, 1,250; made by city at actual cost. Services, galv. i.; paid for by consumer. Meters, 445; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Half-inch meters are furnished and set by city; larger ones are paid for by consumer. Hydrants, public, 135. CONSUMPTION.—(Galls.) av., 1,218,508; max., 1,557,557; min., 1,068,162. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. One steam fire engine used for large fires. FINANCIAL.—Cost, $134,857. Expenses: Operating, $14,174. Revenue: Consumers, $23,341. MANAGEMENT.—Prest., B. F. Dillon; Secy., A. W. Cockwell, Jr.; Supt., R. N. Ellis; Ch. Pump. Engr., F. W. Ellis. Rept. by Supt., June 15, '96. PROJECTED IMPROVEMENTS.—2—5,000,000-gall pumps; 40 miles of mains; stand-pipe; all costing $225,000; to be completed Dec. 1. Press repts. state that the new pumps are Worthington, and were tested in Dec.; that two small aerating basins were built; 19 miles of mains laid and 156 hydrants set in '96; also that elevated tank, instead of stand-pipe, will be built in '97, with cap. of 300,000 galls. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 15, '81.

F 1. **KEY WEST,** Monroe Co. (18,080.) Built in '95 by city; put in operation in Sept. Engr., R. Taylor Gleaves, Lynchburg, Va. Contrs., Virginia Paving & Construction Co. Supply, artesian well, pumping to stand-pipe. Pumps, cap., 5,000,000 galls. 2—2,500,000 Snow dup. cond. Bituminous coal used; av. cost, $6 to $8 per short ton. Stand-pipe, cap., 176,237 galls.; steel; 20 × 75 ft. Fiscal year closed Aug. 6. Mains, 8½ miles. Hydrants, public, 82. Pressure, ordinary, 51 lbs.; fire, 125 lbs. Steam fire engines are used. Cost, $100,000. Bonded debt, $100,000, at 6%; due in 30 yrs. Prest. and Supt., B. B. Whalton; Secy., Hugh Green; Ch. Pump. Engr., T. J. Asher. Rept. by Prest., Aug. 14, '96. SEWERS.—Has storm and surface water sewers only.

7. **LAKE CITY,** Columbia Co. (2,020.) Built in '88 by Lake City Water & Light Co. FRANCHISE.—20 yrs. from '88. Rates are fixed in franchise and subject to regulation by city. Co. not exempt from local taxes. City to pay $800 per yr. No legal difficulties. SUPPLY.—Spring Lake, pumping direct. PUMPS.—Worthington and Smith-Vaile. FILTERS.—Cap., 500,000 galls.; charcoal. DISTRIBUTION.—Mains, 7 miles; cost extensions met by Co. as required. Taps, 125; made by Co., free. Services, galv. i.; paid for by consumer. Meters: 30; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 250,000; max., 500,000; min., 150,000. PRESSURE.—Ordinary, 40 to 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $66,000, including light machinery, etc. Cap. Stock: Authorized, $75,000; paid-up, $50,000; paid no div'd in '95. Pref'd, authorized, $25,000; no

div'd guaranteed. Debt, $25,000: Floating, $15,000, at 6%; bonded, $10,000, 6%. Expenses: Operating, $2,200; taxes, $100. MANAGEMENT.—Prest. and Supt., Wm. R. Bush; Secy., L. Harrison; Treas., F. V. Bush; Ch. Pump. Engr., M. H. Mars. Rept. June 7, '96. PROJECTED IMPROVEMENTS.—2 miles of 6-in pipe. SEWERS.—None.

8. **LEESBURG**, Lake Co. (722.) Built by Smith & Westland. FRANCHISE.—5 yrs. from '94. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Deep wells, pumping to tank and direct for fire purposes. PUMPS.—Cap., 650,000 galls.; 475,000 Blake; 175,000 Smith-Vaile. TANK.—Cap., 22,000 galls.; cypress; on iron tower 90 ft. high. DISTRIBUTION.—Mains, about 3 miles. Taps, 58; made by consumer, no fee to works. Services, galv. 1.; paid for by consumer. Meters, 0. Hydrants, public, 10. PRESSURE.—Ordinary, 45 lbs. Steam fire engines are used. MANAGEMENT.—D. C. W. Smith, Philadelphia; A. Westland, Wyoming, Ont. Rept. by Supt., Geo. C. Warner, Jan. 19, '97. SEWERS.—None.

9. **MADISON**, Madison Co. (781.) Built in '94-5 by city; put in operation in Apr. Engr., J. F. Le Baron, Jacksonville. Contrs., Hebert & Lapayre, Chattanooga. SUPPLY.—Artesian well, pumping to stand-pipe and direct. PUMPS.—Dup. high pressure; also Pohle air lift, with 4-in. delivery pipe to lift water from 150 ft. below surface. STAND-PIPE.—Cap., 132,000 galls.; iron, 15 × 100 ft. DISTRIBUTION.—Mains, 2½ miles. Hydrants, 30. FINANCIAL.—Contract price, $13,700. Bonded debt, $16,000, at 6%, voted for works in May, '94 (press rept.). Rept. from Engr., Aug., '94, just after letting contracts, supplemented by press repts.; hence subject to corrections.

F 2. **MELBOURNE**, Brevard Co. (99.) Built in '89 by individuals for fire protection only. Supply, artesian well, by gravity. Address Frank H. Fee.

10. **OCALA**, Marion Co. (2,904.) Built in '87-8 by Ocala Water Co. FRANCHISE.—25 yrs. from '87. Provides for purchase of works by city at expiration, price to be determined by arbitration, or for renewal of franchise for 5 yrs. Maximum rates are fixed in franchise. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Worthington dup. high pressure. TANK.—Cap., 130,000 galls.; 30 × 25 ft., on brick masonry tower 40 ft. high. DISTRIBUTION.—Mains, 7.5 miles. Taps, 266. Services, galv. 1. Meters, 8. Hydrants, 85. CONSUMPTION.—(Galls.) av., 125,000. FINANCIAL.—Cost, $95,599. Cap. Stock, $50,000. Bonded debt, $60,000, at 6%. Expenses, $7,200: Operating, $3,600; int., $3,600. Revenue, $8,325: Consumers, $4,500; City, $3,825. NOTE.—No rept. since '90-1 Manual.

11. **ORANGE CITY**, Volusia Co. (600.) Built in '92 by Co. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul, Minn. FRANCHISE.—30 yrs. from '92. Co. is exempt from local taxes. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 1,000,000 galls. TANK.—Cap.,100,000 galls. DISTRIBUTION.—Mains, 9 miles. Taps made by Co. Services paid for by consumer. Meters: 20; owned and controlled by Co. Use of meters compulsory for irrigation purposes. Co. can compel use of meters and any consumer may have one. Hydrants, public, 15; private, 20. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 150 lbs. FINANCIAL.—Cost, $96,000. No debt. Expenses: Operating, $2,500; taxes, $96. MANAGEMENT.—Prest., C. A. Bullen; Secy. and Treas., W. Willard; Supt. and Ch. Pump. Engr., F. C. Rowell.

12. **ORLANDO**, Orange Co. (2,856.) Built in '87 by Orlando Water & Sewerage Co. (previously rept. as Orlando Water Co.) FRANCHISE.—Perpetual; provides for purchase of works by city every 10 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is exempt from local taxes. City to pay for hydrant rental. SUPPLY.—Lake, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; two Knowles comp. dup. Wood used; av. cost $2 per cord. STAND-PIPE.—Cap., 106,000 galls.; steel; 12 × 125 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 14 miles; cost extensions met by earnings. Taps, 550; made by Co. for $3. Services, galv. 1.; paid for by property owner. Meters: 6; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 150,000; max., 250,000; min., 60,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt (in '90), $100,000, at 6%. MANAGEMENT.—Prest., J. A. Beeber, Williamsport, Pa.; Secy. and Treas., J. M. Cheney; Supt., H. W. Greetham, June 8, '96. SEWERS.—None.

13. **PALATKA**, Putnam Co. (3,039.) Built in '86-7 by Palatka Water-Works Co. FRANCHISE.—20 yrs.; provides for purchase of works by city at any time after '97; price determined by three disinterested persons. Rates are fixed in franchise. SUPPLY.—White Water branch and springs, pumping to stand-pipe. PUMPS.—Cap., 2,400,000 galls.; 2—1,200,000 Worthington dup., one high pressure and one comp. RESERVOIRS.—Cap., 550,000 galls.; storage. STAND-PIPE.—Cap., 183,600 galls.; iron; 25 × 50 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 13.3 miles. Taps, 460; made by Co. free, including service to street line. Services, galv. 1.; paid for by consumer from street line. Meters: 6; owned and controlled by Co.; repairs paid by one at fault. Use of meters optional with Co.; compulsory for manufacturing and mechanical uses. Hydrants, public, 87. CONSUMPTION.—(Galls.) av., 188,371; max., 211,750; min., 167,700. PRESSURE.—Ordinary, 58 lbs. FINANCIAL.—Cost, $158,083. Cap. Stock: Authorized, $75,000; all paid-up. Bonded debt, $62,000, at 6%. Sinking Fund:

Invested in bonds of Co. MANAGEMENT.—Prest., Harvey Wheeler, Concord, Mass.; Secy., John F. J. Mulhall, Boston, Mass.; Treas., Elbert Wheeler, Boston, Mass.; Supt., Chas. J. Bolinger. Rept. by Supervising Engr., Wm. Wheeler, 89 State St., Boston, Mass., Oct. 5, '96. SEWERS.—None.

14. **PENSACOLA,** Escambia Co. (11,750.) Built in '85-6 by Pensacola Water Co. FRANCHISE.—50 yrs. from '85; provides for purchase of works by city after 10 yrs., price to be determined by arbitration. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Deane. STAND-PIPE.—Cap., 325,000 galls.; iron; 20 × 136 ft. DISTRIBUTION.—Mains, 14 miles; cost extensions met by Co. Taps, 900; made by Co. for $8. Services, galv. i.; paid for by consumer. Meters: 200; owned and repaired by consumer; controlled by Co. Use of meters compulsory for hose and poor closets. Co. can compel use of meters and any consumer may have one. Hydrants, public, 135. CONSUMPTION.—(Galls.) av., 450,000; max., 550,000; min., 300,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Supt., B. R. Pitt. Rept. by Secy .and Treas., H. G. De Silva, Nov. 9, '96. SEWERS.—Has sanitary sewers only.

15. **QUINCY,** Gadsden Co. (681.) Built in '95-6 by Co.; put in operation Jan. 15. Engrs., Hebert & Lapeyre, Chattanooga, Tenn. Contr., C. A. Stooker, Belleville, Ill. FRANCHISE.—Unlimited; provides for purchase of works by city at any time. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. City to pay for hydrants and drinking fountain; 5 yrs. contract. No legal difficulties. SUPPLY.—6-in. artesian well, 610 ft. deep, pumping to tank. PUMP.—Downie well pump. Wood used; av. cost, $1.50 per cord. RESERVOIR.—Cap., 60,000 galls. TANK.—Cap., 50,000 galls.; steel; 14½ × 40 ft., on iron trestle 70 ft. high. Total height, 110 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 140; made by Co. for $2. Services, ¾-in. iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 25,000; min., 17,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $11,000. Cap. Stock: Authorized, $11,000; all paid-up; paid 3% div'd in '96. Sinking Fund: $300. Revenue: Consumers, unmetered, $900; City, all purposes, $420. MANAGEMENT.—Prest., Wm. M. Corry; Secy., H. J. Davis. Rept. by Prest., June 20, '96. SEWERS.—None.

D 2. **RIVERSIDE** (P. O., Jacksonville), Duval Co. (Not given.) Built in '90 by Artesian Well Co.; put in operation Dec. 1. Supply, artesian well, by natural pressure. Mains, 1 mile. Taps, 40. Cost, $5,000. Cap. Stock, $5,000. No debt. Prest., B. R. Powell; Secy., S. E. Foster; Treas., A. J. Hendrick. No rept. since '90-1 Manual.

16, P 1. **SAINT AUGUSTINE,** Saint Johns Co. (4,742.) Built in '84-87 by E. F. Joyce & C. L. Parker. FRANCHISE.—99 yrs. from '84; does not provide for purchase of works by city. Rates not subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artesian wells, by gravity. DISTRIBUTION.—Mains, 5½ miles. Taps, 225; made by Co. Services, galv. i.; paid for by owner. Hydrants, public, 44. PRESSURE.—Ordinary, 15 lbs. Steam fire engines are used. FINANCIAL.—Cost, $35,000. Revenue: City fire protection, $1,700; other purposes, $1,500. MANAGEMENT.—Prest., C. L. Parker. Rept. by Secy. and Supt., E. F. Joyce, July 13, '96.

PROPOSED CITY WORKS.

Contracts were awarded in Nov., '96, for city works. Press repts. state that necessary financial arrangements caused delay in executing contracts, some or all of which were signed in Feb., '97. Engr., J. N. Hazlehurst, Atlanta. Supply, well, pumping to stand-pipe. Est. cost, $65,000. Chn. Bond Trustees, B. Genovar. Press repts. in Mar., '97, stated material was on the ground and construction would be started at once.

P 2. **SAINT PETERSBURG,** Hillsboro Co. (273.) Projected by Co. Oct. 11, '96, F. A. Davis, 1914 Chestnut St., Philadelphia, rept. it was expected construction would be started in Nov., '96; S. Y. Jenners, St. Petersburg, was also interested. Press rept., May, '96, stated that franchise had been granted to West Coast Development Co., and that Co. was being organized in Philadelphia.

17. **SANFORD,** Orange Co. (2,016.) Built in '82 by Sanford Water-Works Co. FRANCHISE.—50 yrs. from '82. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per hydrant, per yr.; other public service free. SUPPLY.—Spring lake, 4 miles from city, by gravity to reservoir in city, thence pumping direct. Area of lake, 40 acres. PUMPS.—Cap., 1,750,000 galls.; Worthington: 1,000,000 and 750,000. Wood used as fuel. RESERVOIR.—Cap., 250,000 galls. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 9 miles. Taps made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 39; private, 2. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cap. Stock: Authorized, $40,000; all paid-up. Bonded debt, $20,000, at 6%; due 1908. Sinking fund, $3,092. Revenue, City, $1,950. MANAGEMENT.—Prest., Treas., Supt. and Ch. Pump. Engr., Frederic H. Rand; Secy., J. K. Smittenger. Rept. by Prest., July 12, '96. SEWERS.—None. REFERENCE.—Eng. News, Sept. 13, '84.

—. **SEVILLE,** Volusia Co. (Est., 500.) Works formerly described as built in '86 by Seville Co. are no longer used for public supply, being owned by J. T. & K. W. Ry. Co.

D 3. **SOUTH JACKSONVILLE,** Duval Co. Not incorporated. (378.) Built in '91 by South Jacksonville Water-Works Co. Engr. and Contr., B. S. Partridge. Franchise for 99 yrs.; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artesian well, natural pressure. Mains, 1 mile; cost extensions met by earnings. Taps, 300; made by Co. for $4. Meters, 0. Pressure, 24 lbs. Cap. Stock: Authorized, $5,000; paid no divi'd in '95. No debt. Expenses: Operating, $2,000. Revenue: Consumers, $3,600. Prest., C. E. Garner, Jacksonville; Secy., H. D. De Grove. Rept. by Prest. No sewers.

18. **TALLAHASSEE,** Leon Co. (2,934.) Built in '90 by Tallahassee Water-Works Co., under 25-yr. franchise. SUPPLY.—Artesian well, 800 ft. deep, pumping to standpipe. PUMPS.—Two Downie double-acting; one 500,000 Barr dup. Wood used. STANDPIPE.—Cap., 235,000 galls.; iron; 20 × 100 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7 miles; w. i. and cement pipe. Taps, 237. Services, iron and lead; paid for by consumer. Meters: 134; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 40. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. S. Keen, Jr.; Secy., H. Bayard Hodge, Philadelphia; Treas., J. W. Hawley; Supt., G. W. Saxon. Rept. by Am. Pipe Mfg. Co., Philadelphia, June 8, '96.

19. **TAMPA,** Hillsboro Co. (5,532.) Built in '89 by Tampa Water-Works Co. FRANCHISE.—30 yrs. from 1889; provides for purchase of works by city after 10 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is exempt from local taxes. City to pay $40 per hydrant per yr. No legal difficulties. SUPPLY.—Magbee Spring, pumping to tank. PUMPS.—Cap., 4,000,000 galls.; Worthington; 1—2,000,000; 2—1,000,000. Wood used; av. cost, $3 per cord. TANK.—Cap., 112,000 galls.; on iron tower 100 ft. high. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 22 miles; cost extensions met by bonds. Taps, made by Co. and consumer. Services, galv. i. Meters are used only in special cases. Use of meters optional in some cases with Co.; compulsory for those not rated. Hydrants, public, 220; private, 1. CONSUMPTION.—(Galls.) av., 500,000; max., 1,500,000. PRESSURE.—Ordinary and fire, 65 lbs. Two steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Treas., A. E. Boardman; Secy., W. A. Campbell. Rept. by Supt. and Ch. Pump. Engr., J. A. Campbell, June 6, '96. SEWERS.—Sanitary and storm sewers being built.

GROUP IV.—GULF AND MISSISSIPPI VALLEY STATES.

Water-Works Completed, in Process of Construction or Projected, in Alabama, Mississippi, Louisiana, Tennessee and Kentucky.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

ALABAMA.

1. **ANNISTON,** Calhoun Co. (9,998.) First supplied in '81 by Woodstock Iron Co., which transferred works to Anniston Land Co. In '89 works were again transferred to present owner, Anniston Water Supply Co., which put improved plant in operation in Aug., '90. FRANCHISE.—Runs 20 yrs. from '90. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. No legal difficulties. SUPPLY.—Springs, pumping to reservoir. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Holly-Gaskill hor. high duty. Av. cost of coal used, $1.60 per short ton. RESERVOIR.—Cap., 6,500,000 galls. FISCAL YEAR CLOSED Sept. 30. DISTRIBUTION.—Mains, 23 miles; cost extensions met by revenue. Taps, made by Co. for $2.50. Services, w. i. and lead; paid for by property owner. Meters, owned, controlled and repaired by Co.; yearly rental, $5 for ¾-in. Use of meters compulsory for manufacturers, hotels and livery stables. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 109; private, 36. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 95 lbs. FINANCIAL.—Cap. Stock: Authorized, $500,000; all paid-up. Bonded debt, $400,000. MANAGEMENT—Prest., T. G. Bush; Secy. and Treas., John H. Frye; Ch. Pump. Engr., T. J. Fowler. Rept. by Supt., H. B. Rudisill, Aug 10, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, June 2, '83.

P 1. **ATHENS,** Limestone Co. (940.) Bids for bonds for works were to be received Feb. 1, '97. Supply, spring, near center of town, pumping to stand-pipe. No Engr. yet. Repts. by Mayor, Thos. C. McClellan, Dec. 31, '96, and Jan. 12, '97.

2. **ATTALLA,** Etowah Co. (1,254.) Built in '92 by city; put in operation Aug. 1. Engr., John M. Sulley, Chickamauga. Contrs. (press repts.), Hartford, Hebert & Co., Chattanooga. SUPPLY.—Pumping to steel tank or stand-pipe. Av. cost of coal used, $1.65 per short ton. RESERVOIR.—Cap., 60,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 15 miles; cost extensions met by city. Taps, 300 to 400; made by city. Services paid for by owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 45,000. PRESSURE.—Ordinary, 90 lbs.; fire, 140 lbs. MANAGEMENT.—Secy. and Treas., B. P. Hamonds. Rept. by Supt. and Ch. Pump. Engr., Jno. Choate, Aug. 5, '96. SEWERS.—Has sanitary sewers.

3. **BESSEMER,** Jefferson Co. (4,544.) Built in '88 by Bessemer Land & Improvement Co. SUPPLY.—Springs, by gravity to reservoir, thence by pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls. 2—1,000,000 Blake comp. dup. Bituminous coal used; av. cost, $1.05 per short ton, delivered. RESERVOIRS.—Cap., 8,285,000 galls.; 5,000,000 and 3,000,000; also 235,000, pumping basin. STAND-PIPE.—Cap., 235,000 galls.; steel; 20 x 100 ft. DISTRIBUTION.—Taps, 600; made by Co. Services, w.i. or lead; paid for by consumer. Meters: 1; owned, controlled and repaired by Co. Use of meters compulsory for iron Co. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 900,000. PRESSURE.—Ordinary, 45 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $200,000. Floating debt, none.

MANAGEMENT.—Prest., H. F. De Bardleben; Secy., H. M. McNutt. Rept. by Supt., G. H. Stevenson, June 6, '96. PROJECTED IMPROVEMENTS.—Extra supply. SEWERS.—Has sanitary sewers.

4. **BIRMINGHAM,** Jefferson Co. (26,178.) Now owned by Birmingham Water-Works Co.; built in '72-3 by Ellerton Land Co. FRANCHISE.—30 yrs. from '88, and provides for optional purchase of works by city in 1917 or at the end of any 10 yrs. thereafter, price to be determined by arbitration, if necessary. Rates are limited by original contract. Co. is not exempt from local taxes. City to pay $55 per hydrant, per annum. No legal difficulties. SUPPLY.—Cahaba River, pumping to reservoir; Five Mile Creek, pumping direct. A canal, 7 miles, leads from Cahaba River to settling basin. PUMPS.—Cap., 23,000,000 galls. 2—2,000,000 Blake; 1—6,000,000 Deane; 1—5,000,000 Worthington, comp. high duty; 1—8,000,000 Knowles. Bituminous coal used; av. cost, $0.90 to $0.95 per short ton. RESERVOIRS.—Cap., 148,500,000 galls. Storage, 10,000,000; distributing, 110,000,000 and 28,500,000; on top of Shades Mt., 5 miles from the city. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 70 miles; cost extensions met by earnings. Taps, 4,000; made by Co. for $5, deposit on water rent. Services, lead; paid for by consumer. Meters: 350; owned, controlled and repaired by Co.; yearly rental, $3 to $20. Use of meters compulsory for large consumers and manufacturers. Co. can compel use of meters except for dwellings. Hydrants, public, 244. CONSUMPTION.—(Galls.) max., 10,310,000; min., 7,222,660. Consumption is large, owing to few meters used and heavy pressure. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. Fire engines are used. FINANCIAL.—Cost, $1,377,284. Cap. Stock: Authorized, $500,000; all paid-up. Debt (in '90), $628,000: Floating, $173,000, at 7%; Bonded, $455,000, at 6%; due 1917. MANAGEMENT.—Prest., Jas. T. Woodward, N. Y. City; Secy., J. F. Graham. Rept. by Supt., W. J. Milner, June 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Oct. 1, '81; early works, Worthington pump and pressure regulator, Apr. 16, '92, illus.

P 2. **BREWTON,** Escambia Co. (1,115.) Press rept., Feb., '96, that $18,000 of bonds for works would be issued. Makers rept. that 1,000,000-gall. Laidlaw-Dunn-Gordon was constructed in '92 for use here.

5. **BRIDGEPORT,** Jackson Co. (1,181.) Built in '90-1 by Bridgeport Water-Works Co. SUPPLY.—Mountain spring, by gravity. TANK.—Cap., 734,350 galls.; 50 × 50 ft. DISTRIBUTION.—Mains, 15 miles. Taps, 125. Services, galv. i. Meters, 125; compulsory for all services. Hydrants, public, 50. PRESSURE.—Ordinary, 125 to 180 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., David Giles, Chattanooga, Tenn. Rept. by Supt., W. H. Brundige, Nov. 30, '96.

F 1. **BRUNDIGE,** Pike Co. (470.) Built in '96 by city for fire protection. No legal difficulties. Supply, well, pumping by windmill. Tank, cap., 10,000 galls.; cypress, 12 × 12 ft., on tower 33 ft. high. Cost, $450. No debt. Supt., W. G. Hicks. Rept. by E. A. Butler, Sept. 3, '96. No sewers

——? **COLUMBIA,** Henry Co. (960.) Unsigned rept., Dec. 26, '96, stated that works were in existence, owned by the city. Supt., C. Thompson. Small works were listed as projected in '90-1 Manual.

P 2½. **CULLMAN,** Cullman Co. (1,017.) Rept. in Mar., '97, that plans for works were ready. Cy. Clk., W. H. Jones.

6. **DECATUR AND NEW DECATUR,** Morgan Co. (Decatur, 2,765; New Decatur, 3,565.) Now owned by Decatur Water-Works Co., title having been obtained by foreclosure of mortgage in '94. Built by Decatur Water Co. in '89. FRANCHISE.—Perpetual (previously rept. as for 25 yrs.); does not provide for purchase of works by city. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay for hydrant rental under sundry contracts. SUPPLY.—Tennessee River, pumping to stand-pipe or direct. PUMPS.—Cap., 5,000,000 galls.; 2—2,500,000 Deane single high pressure cond. TANK.—Cap., 282,000 galls.; iron; 20 × 120 ft., on stone foundation. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 24 miles. Taps, 750; made by consumer. Services, galv. i.; paid for by consumer. Meters: 3; owned by consumer. Use of meters optional with Co.; compulsory for railways and factories. Hydrants, public, 183; private, 1. CONSUMPTION.—(Galls.) av., 300,000; max., 800,000; min., 160,000. PRESSURE.—Ordinary, 65 lbs.; fire, 90-110 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Lafayette B. Gleason, N. Y. City; Treas., Jas. S. Pirtle, Louisville; Supt., R. H. Adams; Ch. Pump. Engr., E. R. Whitton. Rept. June 15, '96, by Secy. and Gen. Mgr., Edwin G. McInnes, 209 Washington St., Boston. SEWERS.—Partial system of sanitary and storm sewers.

7. **DEMOPOLIS,** Marengo Co. (1,898.) Built in '95 by city; put in operation Dec. 1. Engrs. and Contrs., Hebert & Lapayre, Chattanooga, Tenn. SUPPLY.—Artesian well, flowing into reservoir, thence by pumping to stand-pipe. PUMPS.—Cap., 250,000 galls.; 2—125,000 Dunn-Gordon, dup. (Makers cap. of 500,000 galls.) Warrior Run bituminous coal used; av. cost, $2 per short ton, delivered. RESERVOIRS.—Cap., 100,000 galls.; 4—25,000 cisterns connected underground. STAND-PIPE.—Cap., 120,000 galls.; steel; 12 × 90 ft., on brick tower 32 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Taps, 125; made by city for $8, including service to curb. Services, iron; paid for by consumer from curb. Meters, 0; controlled by city; repairs paid by owner; yearly

rental, 20% of cost. City can compel the use of meters and any consumer may have one. Hydrants, public, 36; private, 1. CONSUMPTION.—(Galls.) av., 25,000; max., 35,000; min., 18,000. PRESSURE.—Ordinary, 57 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $21,000. Bonded debt, $15,000, at 6%; due in 20 yrs. Expenses: Operating, $1,200; int., $900. Revenue: Consumers, $1,500; City, fire protection, $900. MANAGEMENT.—City Treas., E. B. McCarty; Supt., J. G. Chisholm; Ch. Pump. Engr., W. R. Lyrscomb. Rept. by Supt., June 22, '96. SEWERS.—None.

P 3. **DOTHEN,** Henry Co. (247.) Citizen rept., Nov., '96, that city proposed to build works, pumping from artesian well to stand-pipe; that well had been sunk 500 ft. and abandoned. Press rept., Jan. 30, '97, stated bill had been introduced in legislature authorizing $20,000 water bonds; also Feb. 6, '97, that work was to be resumed on well.

8, 9. **EUFAULA,** Barbour Co. (4,394.)

EUFAULA WATER CO.

Built in '87-8. FRANCHISE.—Provides for purchase of works by city in 1906. Rates are fixed in franchise and must not be higher than in other cities similarly situated. SUPPLY.—Little Chewalla Creek and Shorter Springs branch, pumping from storage reservoir to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Davidson. RESERVOIR.—Cap., 570,000 galls. STAND-PIPE.—Cap., 278,600 galls.; 26 × 70 ft. DISTRIBUTION.—Mains, 7 miles. Hydrants, public, 52. FINANCIAL.—(In '88.) Cost, $60,000. Bonded debt, $60,000, at 6%. Revenue (in '90): City, fire protection, $3,120. MANAGEMENT.—Prest., S. H. Dent; Secy. and Treas., E. B. Young; Supt., Alex. McKay. Rept. by Supt., Oct. 5, '96.

CITY WORKS.

Built in '96; tested in Nov. Engr., J. L. Ludlow, Winston, N. C. Contrs., Guild & White, Chattanooga. SUPPLY.—By pumping. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. DISTRIBUTION.—Mains, 10 miles. MANAGEMENT.—Mayor, P. B. McKenzie; Cy. Clk., G. A. Roberts. Information from Engr., official advertisement and press rept.

10. **FLORENCE,** Lauderdale Co. (6,012.) Now owned by city; first supplied in '87 by Cypress Water-Works Co. In '89 Jeter & Boardman Water & Gas Assn. bought plant and combined it with new system. In Feb., '96, the Baltimore bondholders bought the plant and later sold it to the city for $125,000, payable in 30-yr. bonds, at 2½% until 1900 and at 5½% thereafter. SUPPLY.—Cypress Creek, pumping to tank. PUMPS.—Cap., 2,000,000 galls. 2—1,000,000 Worthington comp. non-cond. TANK.—Cap., 300,000 galls.; on tower. DISTRIBUTION.—Mains, 17 miles. Hydrants, public, 103. PRESSURE.—Ordinary, 69 lbs.; fire, 90 lbs. FINANCIAL.—Cost the city $125,000. Bonded debt, $125,000, at 2½% until 1900, thereafter 5½ %; due in 30 yrs. MANAGEMENT.—Rept. by Supt., T. A. Howell, Oct. 31, '96.

11. **FORT PAYNE,** De Kalb Co. (2,698.) Built in '89 by Fort Payne Coal & Iron Co. SUPPLY.—Springs, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Deane dup. STAND-PIPE.—Cap., 263,000 galls.; 30 × 50 ft. DISTRIBUTION.—Mains, 9 miles. Taps, 304. Meters, 65. Hydrants, 52. PRESSURE.—(In '89.) Ordinary, 85 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $68,000. Cap. Stock: Authorized, $400,000; paid-up, $80,000. Bonded debt, $80,000, at 6%. Expenses: Operating, $500; int., $4,800. Revenue, $7,800: Consumers, $5,200; City, $2,600. NOTE.—No rept. since '90-1 Manual.

12. **GADSDEN,** Etowah Co. (2,901.) Built in '85-6 by Gadsden Water-Works Co.; went in the hands of a receiver in Sept., '96. FRANCHISE.—20 yrs. SUPPLY.—Coosa River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Deane. FILTERS.—Cap., 325,000 galls.; Hyatt (or New York). RESERVOIR.—Cap., 1,800,000 galls.; is being enlarged by about 800,000 galls. and lined with 4 ins. of concrete. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 7½ miles. Taps, 300. Hydrants, public, 65. FINANCIAL.—Cost, $62,000. Cap. Stock, $75,000. Bonded debt, $62,000, at 8%. Expenses: Operating, $3,000. Revenue, $7,725: Consumers, $3,000; City, fire protection, $4,725. MANAGEMENT.—Receiver, W. G. Brockway; Supt., M. E. Jones. Rept. by Supt., Sept. 30, '96. PROJECTED IMPROVEMENTS.—A new 1,000,000-gall. pump and a 1,500,000-gall. filter.

—? **GREENSBORO,** Hale Co. (1,759.) Press rept., May, '93, stated works had just been completed and tested.

13. **GREENVILLE,** Butler Co. (2,806.) Built in '90 by Greenville Water-Works Co.; put in operation in Nov. FRANCHISE.—25 yrs. SUPPLY.—Artesian well and creek, pumping to stand-pipe. PUMPS.—750,000 Barr dup. and 7¾-in. Barr artesian. Wood used. TANK.—Cap., 91,800 galls.; wooden; 25 × 25 ft. on trestle. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles. Taps, 148; made for $4. Services, iron and lead; paid for by consumer. Meters: 9; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 49. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., F. M. Brooke; Secy., H. Bayard Hodge, Philadelphia. Treas., J. W. Hawley. Supt., E. K. Adams. Rept. by American Pipe Mfg. Co., 1319 Filbert St., Philadelphia, June 8, '96.

14. **HUNTSVILLE,** Madison Co. (7,995.) Now owned by city. First supplied in '25; ownership not stated. In '36 Thos. Fearn built works, city owning reservoir jointly with

him, which were bought by city in '58 for $10,000. SUPPLY.—Artesian wells, flowing into reservoir, thence pumping to stand-pipe. PUMP.—Cap., 4,000,000 galls.; 1,000,000 Gordon & Maxwell comp. cond.; 3,000,000 Deane comp. dup., erected in '91 (rept. by maker). RESERVOIR.—Cap., 200,000 galls. DISTRIBUTION.—Mains, 4.5 miles. Taps, 470. Meters, 0. Hydrants, 22. FINANCIAL.—Bonded debt, $15,000, at 5%. Expenses: Operating, $2,733. Revenue, $4,000. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 31, '83.

15. **JACKSONVILLE,** Calhoun Co. (1,237.) Owned by Jacksonville Water-Works Co. Built in '83 by town; sold in '89 to Martin & Gaboway. SUPPLY.—Springs, by gravity, to and from reservoir. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—(In '87.) Mains, 4 miles. Taps, 200. Meters, 0. Hydrants, 30. FINANCIAL.—(In '87.) Cost, $40,000. Bonded debt, $20,000, at 5%. Expenses, $2,800: Operating, $1,800.; int., $1,000. Revenue, $6,000: Consumers, $3,000; City, $3,000. MANAGEMENT.—Supt., C. D. Martin. NOTE.—No rept. since '90-1 Manual, except unsigned rept., Nov., '96, giving ownership and Supt.

——? **MARION,** Perry Co. (1,982.) Press repts. in '94-5 stated works were being built, with J. C. Lee & Co., Scotts' Station, as Contrs.; that there would be a 100,000-gall. reservoir, 50,000-gall. elevated tank and 50 hydrants; also that $28,000 of bonds would be issued. No indication whether works were ever completed.

16, 17. **MOBILE,** Mobile Co. (31,076.)

BIENVILLE WATER SUPPLY CO.

Built in '86-8 by Bienville Water Supply Co. FRANCHISE.—Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per fire hydrant per annum. Supplementary contract for 12 years. LEGAL DIFFICULTIES.—Mobile Water-Works Co. (see below) brought suit against Co. in '86-8, claiming exclusive right to supply city. Supreme Court decided adversely. SUPPLY.—Springs, pumping to stand-pipe and reservoir. PUMPS.—Cap., 12,000,000 galls.; 2—6,000,000 Holly-Gaskill hor. high duty. Wood used; av. cost, $1.75 per cord. RESERVOIRS.—Cap., 12,000,000 galls.; storage and distributing, 204 ft. above city. STAND-PIPE.—At reservoir; 8 × 85 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 40 miles; cost extensions met by income. Taps, 2,300; made by Co. for $8. Services, galv. i.; paid for by property owner. Meters: 60; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 260; private, 20. CONSUMPTION.—(Galls.) av., 4,000,000; max., 4,250,000; min., 3,000,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $1,350,000. Cap. Stock: Authorized, $500,000. Bonded debt, $750,000, at 6%. Expenses: Operating, $30,000; int., $45,000; taxes, $5,500. MANAGEMENT.—Prest., Geo. H. Ketchum; Secy., A. Pope St. John; Treas., Walter Wood; Supt. and Ch. Pump. Engr., W. C. Pooley. Rept. by R. D. Wood & Co., Philadelphia. SEWERS.—About ½ mile of sanitary sewers. REFERENCE.—Eng. News, May 16, '85.

MOBILE WATER-WORKS CO.

Built in '40 by —— Stein, who contracted to supply city for 20 yrs., after which city was to buy works. No settlement being made in '60 works continued under private ownership. SUPPLY.—Creek, pumping to stand-pipe. PUMPS.—One 10 × 48 water power from West Point (N. Y.) Foundry Co.; also Blake comp. cond. DISTRIBUTION.—Mains, 22 miles. Taps, 1,200. Meter, 1. Hydrants, 150. FINANCIAL.—Cost, $200,000. Expenses: Operating, $8,000. NOTE.—No official rept. since '85. Dec. 3, '96, C. L. Lavretta, Mayor, rept. that works were still in use, but doing little business, owing to competition of other plant; also that A. D. Stein was (he thought) Prest.

18. **MONTGOMERY,** Montgomery Co. (21,883.) Present works built in '86 by Capital City Water Co. First works built in '78 by Montgomery Water-Works Co., which was reorganized in '80. FRANCHISE.—15 yrs. from '85; provides for purchase of works by city every 5 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $55 per fire hydrant per yr., and to pay for all water in excess of 15,000,000 galls. per yr. LEGAL DIFFICULTIES.—Court has decided that under contract Co. must furnish water for street sprinkling without extra charge. Courts also decided, in a number of cases, in favor of Co. where matters relating to use and rent of meters were involved. In '94, Co.'s charter was forfeited by suit brought by citizen. Charter included provisions of contract with city, which called for supply from deep wells, exclusively. Temporary supply was pumped from river and charter forfeited on that score, Dec., '94. Receiver was immediately appointed by U. S. Court and property has remained in his hands since. SUPPLY.—Artesian wells, 450, 650 and 710 ft. deep, flowing to reservoir, thence pumping through main to stand-pipe. PUMPS.—Cap., 7,000,000 galls. 1,000,000 Worthington non-comp. high pressure; 2—3,000,000 Deane, a high pressure and comp. cond. Alabama bituminous coal used; av. cost, $2.05 per short ton. RESERVOIRS.—Cap., 2,000,000 galls. 4—500,000 brick circular basins at pumping station. TANK.—Cap., 417,000 galls.; 105 × 25 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 40 miles. Taps, 2,935; made by Co. at $4 for ½-in.; $5 for ¾-in.; $6 for 1-in. Services, iron and lead; paid for by property owner. Meters: 1,353; owned principally by, controlled and repaired by Co.; yearly rental, $3. Use of meters compulsory for all but domestic services. Hydrants, public,

210; private, 40. CONSUMPTION.—(Galls.) av., 1,833,900; max., 2,000,000; min., 800,000. PRESSURE.—Ordinary, 95 lbs.; fire, 110 lbs. Steam fire engines are used somewhat. FINANCIAL.—Cap. Stock: Authorized, $350,000; all paid-up; no div'd in '95. Bonded debt, $350,000, at 6%; due 1905. No sinking fund. MANAGEMENT.—Rept. by Fred Crosby, Receiver, June 17, '96. NOTE.—Feb., '97, steps were being taken by city to secure Engr. to prepare plans for city works and to estimate value of Co. plant and the cost of needed improvements to it. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 13, '81.

6. **NEW DECATUR,** Morgan Co. (3,565.) Supply from Decatur.

19. **OPELIKA,** Lee Co. (3,703.) Built in '92 by Opelika Water-Works Co.; put in operation in Apr. Engrs. and Contrs., American Pipe Mfg. Co., Philadelphia. SUPPLY.—Creek, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 gall.; 2—500,000 Barr simple dup. Bituminous coal used. STAND-PIPE.—Cap., 180,880 galls.; 18 × 95 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 8 miles. Taps, 131; made for $4. Services, iron and lead; paid for by consumer. Meters: 5; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 60. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., E. F. Partridge; Secy., H. Bayard Hodge, 1319 Filbert St., Philadelphia; Treas., J. W. Hawley; Supt., Geo. E. Driver. Rept. June 8, '96, by American Pipe Mfg. Co., Philadelphia.

20. **OZARK,** Dale Co. (1,195.) Built in '91 by city; put in operation Apr. 15. Engrs., Ferris & Edwards. No contr. SUPPLY.—Spring, pumping to stand-pipe. Wood used as fuel; av. cost, $1.50 per cord. RESERVOIR.—Cap., 56,000 galls. STAND-PIPE.—Cap., 67,000 galls.; iron, 12 × 80 ft. FISCAL YEAR CLOSED Mar. 30, '96. DISTRIBUTION.—Mains, 2½ miles. Taps, 75; made by city. Services, paid for by consumer. Meters, 0. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 5,600. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $10,000. Expenses: Operating, $525. MANAGEMENT.—Supt. and Ch. Pump. Engr., B. S. Brown. SEWERS.—None.

21. **PIEDMONT,** Calhoun Co. (711.) Built in '93 by Geo. D. Harris for the Piedmont Electric & Water Supply Co. FRANCHISE.—20 yrs. from '93. No legal difficulties. SUPPLY.—Two springs turned into reservoirs, by pumping. PUMPS.—Cap., 2,000,000 galls.; Worthington. Av. cost of coal used, $1.40 per short ton. RESERVOIRS.—Cap., 250,000 galls.; storage. DISTRIBUTION.—Taps, 200; made by Co. Services, paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 35,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cap. Stock, $30,000. Revenue: City, fire protection, $1,200; other purposes, $700. MANAGEMENT.—Prest., Geo. D. Harris; Secy. and Treas., F. H. Harris; Supt., W. H. Alexander; Ch. Pump. Engr., Chas. R. McKee. Rept. by Secy., Sept. 3, '96.

22. **SELMA,** Dallas Co. (7,622.) Built in '86 by Selma Water Co. FRANCHISE.—30 yrs. from '86; provides for purchase of works by city at any time after 10 yrs. Rates are regulated by contracts. Co. is not exempt from local taxes. SUPPLY.—10 artesian wells, overflowing, pumping to stand-pipe and direct. PUMPS.—Cap., 5,650,000 galls.: 3,000,000 Snow comp.; 2—1,000,000 and 1—650,000 Worthington high pressure, one of the larger being comp., other two, non-comp. Bituminous coal used; av. cost, $2.07 per short ton. RESERVOIRS.—Cap., 7,700,000 galls.: two distributing, 700,000; one storage, 7,000,000. STAND-PIPE.—Cap., 185,000 galls.; iron; 15 × 140 ft. FISCAL YEAR CLOSED Jan 1. DISTRIBUTION.—Mains, 14 miles. Taps, 830; made by Co. for $4 to $6. Services, iron; paid for by consumer. Meters: 16; 3 owned by Co., balance by consumer; controlled by Co.; repairs paid by consumer. Use of meters compulsory for livery stables and motors. Co. can compel use of meters and any consumer may have one. Hydrants, public, 111; private, 10. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,500,000; min., 750,000. PRESSURE.—Ordinary, 55-60 lbs.; fire, 110 lbs. One steam fire engine held in reserve. FINANCIAL.—Cap. Stock: Paid-up, $125,000. Bonded debt, $100,000, at 6%. MANAGEMENT.—Prest., Wm. Henry White, N. Y. City; Secy. and Supt., H. A. Haralson; Ch. Pump. Engr., Chas. Delmeck. Rept. by Secy., June 6, '96. SEWERS.—Has sanitary and storm sewers.

23. **SHEFFIELD,** Colbert Co. (2,731.) First supplied in '73 from temporary works built by Sheffield Land, Iron & Coal Co., which owned town site. In '80-90 Sheffield Water Co. built works, which, June 1, '96, were transferred to Water, Light & Power Co.. FRANCHISE.—30 yrs. from '96; provides for optional purchase of works by city in 15 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $35 per hydrant per yr. No legal difficulties. SUPPLY.—Tennessee River, pumping to tank. PUMPS.—Cap., 950,000 galls.; 200,000 and 750,000 Worthington non-comp. high pressure. Bituminous coal used; av. cost, $1.15 per short ton. TANK.—Cap., 90,000 galls.; cypress. FISCAL YEAR CLOSED Apr. 15. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by issuing bonds. Taps, made by Co. Services, c. i.; paid for by property owner. Meters, 0. Use of meters compulsory for large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 80,000; max., 105,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $36,000. Cap. Stock: Authorized, $250,000; paid no div'd. Floating debt, $12,000. Bonds: $50,000 in bonds will be issued as soon as possible. Expenses: Operating, $1,975; taxes, $64. Revenue: Consumers, unmetered, $36,000.

MANAGEMENT.—Prest., E. F. Eusten, Birmingham; Secy. and Treas., C. B. Ashe; Supt., Thos. Gothard. Rept. by Secy., June 6, '96. PROJECTED IMPROVEMENTS.—Reservoir of 2,500,000 galls. and filter basin (unless stand-pipe is decided on), new pumps, larger mains and fire hydrants; cost, $30,000. SEWERS.—Has sanitary sewers.

24. **SHELBY,** Shelby Co. (758.) Built in '90-1 by Alabama Coal & Iron Co., to supply their furnaces and, incidentally, the town. SUPPLY.—Springs, pumping direct. PUMPS.—Cap., 2,000,000 galls.; Deane comp. dup. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 4.5 miles. Hydrants, 10. PRESSURE.—Ordinary, 70 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $40,000. NOTE.—No rept. since '90-1 Manual.

D 1. **SPRING GARDEN,** Cherokee Co. (Est., 400.) Built in '89 by Spring Garden Water-Works Co. Franchise does not provide for purchase of works nor regulation of rates by city. Supply, Glade Springs, pumping to 60,000-gall. reservoir, by means of 5,000-gall. pump from Aeromotor Co., Chicago. Mains, ¾ mile. Taps, 4. Hydrants, 1. Cost, $1,500. Cap. Stock: Authorized, $2,500; paid-up, $1,300. Expenses: Operating, $10. No revenue. No rept. since '90-1 Manual.

25. **TALLADEGA,** Talladega Co. (2,063.) Owned since '94 by Talladega Light & Water Co.; Built in '86 by Talladega Gas, Light & Water Co. FRANCHISE.—25 yrs. from '86; provides for optional purchase of works by city after 10 yrs. Rates are not subject to regulation by city. Co. is exempt from local taxes. City to pay $2,400 a year for water. SUPPLY.—Large spring, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000, from Birmingham Iron Works. Alabama bituminous coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 138,544 galls.; 14 × 135 ft., on hill 45 ft. above pump house. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by surplus earnings. Taps, 375; made by Co., free. Services, w. i.; paid for by consumer. Meters, 0. Hydrants, public, 40; private, 6. CONSUMPTION.—(Galls.) av., 150,000 to 200,000; max., 400,000; min., 100,000. PRESSURE.—Ordinary, 70 lbs.; fire, 80 lbs. FINANCIAL.—Cap. Stock: Authorized, $60,000, for gas and water; all paid-up. Bonded debt, $60,000, at 6%. MANAGEMENT.—Prest., M. L. Ernst, New York City; Secy. and Treas., C. J. Bowie. Rept. by Supt., T. L. Bellengrath, July 13, '96. SEWERS.—Has sanitary and partial storm sewers.

26. **TROY,** Pike Co. (3,449.) Temporary system was built in '86 by town; present works were built by city in '94; put in operation in July. Engr., F. C. Hall, Chicago, Ill. Contrs., Remington & Co., Chicago, Ill. SUPPLY.—Several large springs, three miles from city, collected in reservoir, thence pumped to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; Worthington: 750,000 and 1,000,000 comp. non-cond.; 750,000 non-comp. high pressure. (Rept. by makers.) Wood used; av. cost, $1.25 per cord. RESERVOIR.—Cap., 250,000 galls. STAND-PIPE.—Cap., 250,000 galls.; iron; 20 × 110 ft. DISTRIBUTION.—Mains, 10 miles; cost extensions met by city. Taps, 100; made by city at $5 for ½-in; $6 for ¾-in. and $7 for 1-in. Services, iron; paid for by consumer. Meters: 8; owned, controlled and repaired by consumer; yealy rental, none. Use of meters compulsory for extravagant users. City can compel use of meters and any consumer may have one. Hydrants, public, 47. PRESSURE.—Ordinary, 150 lbs. FINANCIAL.—Cost, $68,000. Bonded debt, $50,000, at 6%; due in 30 yrs. Deficits are met by the city out of general fund. MANAGEMENT.—Mayor, W. B. Folmar; City Clk. and Treas., Josiah Jeringan; Supt. and Pump. Engr., W. B. Corley. Rept. by City Clk., June 6, '96. SEWERS.—None.

27. **TUSCALOOSA,** Tuscaloosa Co. (4,215.) Built in '88 by Tuscaloosa Water-Works Co. FRANCHISE.—30 yrs. SUPPLY.—Warrior River, pumping to tank. PUMP.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington non-comp. high pressure. TANK.—Cap., 135,000 galls.; on tower. DISTRIBUTION.—Mains, 8 miles. Taps, 287. Meters, 0. Hydrants, 58. FINANCIAL.—Cost, $76,000. Cap. Stock, $75,000. Bonded debt, $50,000, at 6%. Sinking Fund: $2,000 per yr. NOTE.—No rept.. since '90-1 Manual.

28. **UNION SPRINGS,** Bullock Co. (2,049.) Built in '96 by city; put in operation Sept. 1. Engrs., Felton & Sullivan, Cuthbert, Ga. SUPPLY.—Deep well, by pumping. PUMP.—Smith-Valle-Bierce. MANAGEMENT.—Rept. by J. D. Norman, Jan. 1, '97.

29. **UNIONTOWN,** Perry Co. (854.) Built in '91 by city; put in operation about Dec. FRANCHISE.—Family rate is fixed. Co. is exempt from local taxes. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 936,000 galls.; Smedley dup. Av. cost of coal used, $2.65 per short ton delivered. TANK.—Two 18,000-gall. cypress, on 60 ft. tower. DISTRIBUTION.—Taps, 90; made by city. Services, iron; paid for by consumer. Hydrants, public, 32; private, 1. CONSUMPTION.—(Galls.) av., 6,000; max., 10,000; min., 4,000. PRESSURE.—Ordinary, 80 lbs.; fire, 150 lbs. Force pump at pumping station for fire purposes. FINANCIAL.—Cost, $22,000. Bonded debt, $22,000, at 6%; due 20 yrs. from date of issue. Expenses: Operating, $1,200. MANAGEMENT.—Treas., L. J. Pake; Ch. Pump. Engr., B. Spielman. Rept. by Supt., J. C. Welch, Aug. 7, '96.

MISSISSIPPI.

D 1. **BAY SAINT LOUIS,** Hancock Co. (1,974.) Built in '92 by Chas. Sanger. No franchise. "City wants the use of water without paying for it." Supply, artesian wells,

by natural pressure. Taps, 70. Services, black i.; paid for by property owner. Meter, 1. Pressure, 8 lbs. Cost, $10,000. Expenses: Taxes, $20. Revenue: Consumers, unmetered, $700. MANAGEMENT.—Rept. by owner, Jan. 3, '97. No sewers.

1. **BILOXI,** Harrison Co. (3,234.) Built in '89 by Biloxi Artesian Water-Works Co.; put in operation in '90. FRANCHISE.—25 yrs. from '90. Rates are subject to regulation by city. Co. is exempt from local taxes for 5 yrs. No legal difficulties (see note). SUPPLY.—Artesian well, by gravity from tanks. Dy. cap. of wells, 430,000 galls. TANKS.—Caps., 50,000, 5,000 and 4,500. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 3 miles; cost extensions met by general fund. Taps, 294; made by consumer. Services, paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 40. PRESSURE.—Ordinary, 19 lbs. Steam fire engines are used. FINANCIAL.—Cost, $16,000. Cap. Stock: Common authorized, $8,000; all paid-up; paid no div'd in '95. Floating debt, $3,000, at 7%. Revenue: Consumers, unmetered, $2,200; City, fire protection, none. MANAGEMENT.—Prest., C. F. Theobald; Secy. and Treas., C. E. Theobald. Rept. by Prest., June 10, '96. SEWERS.—None. NOTE.—In '94, city took steps to build works. Co. applied for injunction. No further information. Rept. from Cy. Clk., Phil McCabe, July 24, '94.

2. **CANTON,** Madison Co. (2,131.) Built in '96 by city; put in operation in May. Engr. and Contr., E. A. Stookey, Belleville, Ill. SUPPLY.—Two artesian wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington simple high pressure (rept. by makers). Alabama bituminous coal used; av. cost, $2.30 per short ton on track. STAND-PIPE.—Cap., 210,000 galls.; steel; 16 × 140 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 52; made by city at $5 for ½-in.; $6.50 for ¾-in.; $8 for 1-in. Services, galv. i.; paid for by consumer. Use of meters compulsory for consumers whose yearly rate exceeds $20. Hydrants, public, 42. PRESSURE.—Ordinary, 70 lbs.; fire, 150 lbs. One steam fire engine. FINANCIAL.—Bonded debt, $41,000, at 6%; due in 20 yrs. No sinking fund. MANAGEMENT.—Supt. and Ch. Pump. Engr., E. A. Stimson. Rept. by B. Maas, June 27, '96. SEWERS.—None.

3. **COLUMBUS,** Lowndes Co. (4,559.) Built in '67 by city. SUPPLY.—Two artesian wells, pumping to reservoirs. PUMPS.—Cap., 500,000 galls.; Deane dup. RESERVOIRS.—Two storage; one 40,000 galls. FISCAL YEAR CLOSED Sept. 30. DISTRIBUTION.—Mains, 6 miles. Taps, 525. Meters: 1; owned by Ry. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 175,000. FINANCIAL.—Cost, $35,000. No debt. Expenses, $2,008. Revenue, $3,350. MANAGEMENT.—Com. of two. Chn., J. L. Walker; Supt., H. Wilmot; Asst. Supt., John S. Lanier. Rept. by H. M. Lanier, Marshall, Sept. 26, '96. REFERENCE.—Eng. News, June 24, '82.

P 1. **ELLISVILLE,** Jones Co. (961.) Press rept., Feb. 4, '97, stated aldermen had just held a hearing on building works and matter was favorably considered. Later rept. stated bonds for works had been voted.

4. **GREENVILLE,** Washington Co. (6,658.) Built in '96 by city; put in operation in Sept. Engr., Arthur Hider. Contr., G. Jaeger, Rich Hill, Mo.; works completed about Oct. 1. Various franchises were granted from '87 to '91. SUPPLY.—Four 8-in artesian wells, 480 ft. deep, pumping by air lift to reservoir, thence direct by steam pumps. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington comp. non-cond. Bacon air lift, supplied by two Knowles air compressors, 14 × 14 × 16, used to fill reservoir. Alabama bituminous coal used; av. cost, $2.40 per short ton. RESERVOIR.—Cap., 112,000 galls. DISTRIBUTION.—Mains, 12 miles. Taps, 150; made by city at from $6.60 to $8.60. Services, w. i.; paid for by consumer. Meters: 0. Hydrants, public, 100; private, 6. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 50 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $59,000. Bonded debt, $65,000 (?); press rept., Feb., '96, stated bonds to this amount had just been sold. MANAGEMENT.—Mayor and Supt., Wm. Yerger; City Secy., John M. Lee; Ch. Pump. Engr., E. Copeland. Rept. by Arthur Hider, Engr., Oct. 1, '96. SEWERS.—None.

P 2. **GRENADA,** Grenada Co. (2,416.) Bids were to be received by town Mar. 11, '97, for water and light plants and sewerage system. Engrs., Sanders & Porter, Louisville. Supply, deep wells, pumping to stand-pipe; 2—750,000-gall. hor. comp. dup. pumps and 140,000-gall. steel stand-pipe. Est. cost, $40,000. Mayor, B. C. Adams; Town Clk., W. F. Hallam. Latter rept., Feb. 2, '97, that bonds had not yet been sold.

P 3. **HATTIESBURG,** Perry Co. (1,172.) Private works projected. Supply, artesian well, pumping to stand-pipe; 10,000 ft. mains. Rept. by contr., Jno. A. Sutter, Nov. 17, '96. Press rept., Dec. 15, '96, stated Mr. Sutter had just begun to sink well.

P 3½. **HOLLY SPRINGS,** Marshall Co. (2,246.) Press rept. Feb., '97, stated mayor and council had just held hearing, which was favorable to building works.

5. **JACKSON,** Hinds Co. (5,920.) Built in '88-9 by Jackson Light, Heat & Water Co.; put in operation May 10, '89. FRANCHISE.—30 yrs. from '89; provides for purchase of works by city after 10 yrs. and every 5 yrs. thereafter, price to be determined by arbitration. Rates not to "exceed the average rates charged in other cities in the state of Mississippi similarly situated, and being supplied by a like system." No total rental to be less than $5 per yr. Co. is not exempt from local taxes. City to pay $60 each for first 80 hydrants and $45 for each additional one; contract for 20 yrs. LEGAL.

DIFFICULTIES.—Suit to annul contract; Supreme Court held contract valid. SUPPLY.—Pearl River, pumping to stand-pipe. PUMPS.—Two Deane; one is a 2,000,000 triple exp. Wood used; av. cost, $1.65 per cord; coal, av. cost, $3.70 per short ton. STAND-PIPE.—Cap., 230,112 galls.; steel; 24 × 68 ft., fitted with Engberg electrical cut-off; plates ⅛ to 3-16-in. thick. On hill 120 ft. above lowest parts of town. FISCAL YEAR CLOSED May 30. DISTRIBUTION.—Mains, 17 miles. Taps made by Co. for $7. Services, ¾-in. galv. i.; paid for by consumer. Meters: 20, owned, controlled and repaired by Co.; yearly rental, 30% of cost. Use of meters compulsory for factories, stables, hotels and motors. Co. can compel use of meters and any consumer may have one. Hydrants, public, 123; private, 5; owned by the state, 21. CONSUMPTION.—(Galls.) av., 800,000; max., 1,250,000; min., 600,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $125,000. Cap. Stock: Authorized, $100,000. Bonded debt, $125,000, at 6%. Expenses: Int., $7,500; taxes, $1,000. Revenue: City, fire protection, $6,750; street sprinkling, $160; State, fire protection and institutions, $4,000. MANAGEMENT.—Prest., R. L. Saunders; Secy., M. Green. Rept. by Gen. Mgr., W. F. Wilcox, Sept. 3, '96. SEWERS.—Has partial system of storm sewers. REFERENCE.—Intake, Eng. News, July, 20, '93, illus.

6. **MERIDIAN,** Lauderdale Co. (10,624.) Built in '86-7 by Meridian Water-Works Co.; now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—Provides for purchase of works by city in '97 and at intervals of 5 yrs. thereafter. Rates are fixed in franchise. SUPPLY.—Springs and surface water, pumping from collecting and storage reservoirs. PUMPS.—Cap., 3,750,000 galls. 1—1,750,000 Worthington; 1—2,000,000 Gordon. RESERVOIRS.—Cap., 150,000,000 galls. DISTRIBUTION.—Mains, 17 miles. Hydrants, public, 238. PRESSURE.—Ordinary, 50 lbs.; fire, 80-100 lbs. FIANANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy. and Treas., E. B. Fogle. Supt., Chas. Zeigler. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Aug. 20, '96.

7. **NATCHEZ,** Adams Co. (10,101.) Built in '89 by Natchez Water & Sewer Co. June 10, '91, works were in hands of receiver; bondholders foreclosed in '92. In '89 Co. had 7½ miles sewers. FRANCHISE.—30 yrs. from '89; provides for purchase of works by city 10 yrs. from completion and every 5 yrs. thereafter. Rates are fixed in franchise, which provides that rates shall be those of St. Louis. Co. is not exempt from local taxes. City to pay $5,515 per yr. for public service; $50 for first 100 and $45 for additional hydrants. SUPPLY.—Wells, pumping by air lift to reservoir, thence to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Hughes, one high pressure and one comp. Rand compressor, 12 × 14 × 16-in., for air lift pump. Pittsburg bituminous nut and slack coal used; av. cost, $2.95 per short ton. RESERVOIR.—Cap., 250,000 galls. STAND-PIPE.—Cap., 126,000 galls.; iron; 12 × 150 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, about 12 miles; cost extensions met by earnings. Taps, 336; made for consumer by plumber, with $2 fee to Co. Services, lead and galv. i.; paid for by consumer. Meters: 43; owned by Co. and consumer, in part; controlled by Co.; repairs paid by consumer; yearly rental, $3. Co. can compel use of meters and any consumer may have one. Hydrants, public, 114. CONSUMPTION.—(Galls.) av., 275,000; max., 350,000; min., 200,000. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jas. Richardson; Mgr., Chas. H. Ledlie; Asst. Mgr., Maxime Reber, both of St. Louis; Supt., W. T. Owen; Ch. Pump. Engr., C. T. Richards. Rept. by Mgr., Dec. 1, '96. SEWERS.—Sanitary sewers are owned by the Co.

P 4. **OKOLONA,** Chickasaw Co. (2,099.) City was to receive bids Dec. 31, '96, for $30,000 water and electric light bonds; 6%, 20-yr., with option of call after 5 yrs. No Engr. yet. Supply, wells, pumping to stand-pipe. Est. cost water-works, $25,000. Rept. by E. J. Ezell, Councilman, Nov. 3 and 16, '96.

——? **OXFORD,** Lafayette Co. (1,546.) Put under construction in Jan., '97, by town. Engr., T. A. Tucker, Memphis. Contrs., Sanders & Porter, Louisville. Supply, well, pumping to tank. Est. cost, $18,000. Rept. by Secy., W. D. Porter, Jan. 6, '97, who stated drinking water would not be furnished; this may have been due to misunderstanding of question. Press rept., Jan. 10, '97, stated that $20,000 of 6% 20-yr. bonds had been sold to citizens.

D 2. **PASS CHRISTIAN,** Harrison Co. (1,705.) Built by five different Cos. for domestic supply only. Supply, 23 artesian wells, 450 to 710 ft. deep, by natural pressure. Mains, 4½ miles. Services, Iron; paid for by property owner. Meters, 0. Cost, about $1,500 for each of the five plants. The management of the various companies is as follows: Prests., John H. Lang, of West End Co.; N. Bohn, Pass Christian Artesian Well Assn.; T. V. Courtenay, East End Co.; M. G. May, East End 2nd Co.; and John A. Sutter, Sutter Co. Rept. by John H. Lang, June 6, '96.

P 5. **PORT GIBSON,** Claiborne Co. (1,524.) Bids for complete works, including artesian wells and stand-pipes, were to be received until Feb. 15, '97, by Mayor. Rept. by Cy. Clk., Thos M. Rea, Jan. 10, '97. Feb. 16, '97, F. C. Englesing, Cy. Engr., rept. that contract had been let for deep wells and for 20 × 60 ft. stand-pipe, latter to Chicago Bridge & Iron Co.; also that remainder of contracts would be let Mar. 6, and bonds offered for sale Mar. 15, after which construction would be started.

D 3, P 6. **SCRANTON,** Jackson Co. (1,353.) Built in '90-1 by F. H. Lewis for domestic use only. Supply, artesian wells, by natural pressure, which raises water 33 ft. Two reservoirs, cap., 6,000 galls., and tanks. Mains, 3.8 miles. Taps, 200. Services paid for by consumer. Meters, 0. Cost, $5,000. Operating expenses, $150. Taxes, $22. Rept. by Owner, June 5, '96.

PROJECTED WORKS.

City Council is investigating the subject of building works, but nothing definite has been done. Rept. by Alderman J. D. Clark, Jan. 30, '97.

8. **VICKSBURG,** Warren Co. (13,373.) Built in '87-9 by Vicksburg Water Supply Co. FRANCHISE.—30 yrs. from '86, with option of purchase of works by city every 10 yrs. by appraisement. Rates must not exceed 50 cts. per 1,000 galls. Co. is exempt from local taxes for 5 yrs. from acceptance of works by city. City to pay $65 each per yr. for 100 hydrants and $50 each for 16 additional ones. No legal difficulties. SUPPLY.—Mississippi River, pumping to settling basins and thence repumping to standpipe. PUMPS.—Two Worthington dup., pumping from river; two Deane comp. cond. dup., pumping from settling basins. Alabama run of mine bituminous coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 2,154,000 galls. STAND-PIPE.—Cap., 329,000 galls.; iron, 20 × 140 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 16 miles; cost extensions met by earnings. Taps, 529; made by Co., for $12, including service to curb. Services, lead; paid for by consumer. Meters, 96; owned by Co. and consumers, in part; controlled by Co.; repairs paid by consumer; yearly rental, $6 for ½-in. Co. can compel use of meters and any consumer using water to amount of $18 is allowed to have one; compulsory for manufacturers. Hydrants, public, 116; private, 8. CONSUMPTION.—(Galls.) av., 823,500. PRESSURE.—Ordinary, 20 to 140 lbs. FINANCIAL.—Cost, $275,000. Cap. Stock: Authorized, $250,000; all paid-up. Bonded debt, $250,000, at 6%; due in 1917. Expenses, $33,607; Operating, $17,448; int., $15,000; taxes, $1,159. Revenue, $26,126: Consumers, unmetered, $8,299; metered, $10,683; City, fire protection, $6,888; street sprinkling, $180; public buildings, $76. MANAGEMENT.—Prest., Whitney Conant; Secy. and Treas., W. G. Snow, New York; Supt., Chester R. McFarland; Ch. Pump. Engr., Frank L. Barstow. Rept. by Secy., Dec. 10, '96. SEWERS.—Has partial storm sewers.

— ? **WATER VALLEY,** Yalobusha Co. (3,832.) Oct. 12, '94, M. D. L. Stephens, Clk., rept. that construction of works to be owned by the city was well under way. Press rept., April 25, '95, stated works had just been tested and gave 90 lbs. pressure.

P 7. **WEST POINT,** Clay Co. (2,762.) Plans are specifications being prepared by Walter G. Kirkpatrick, Nashville. Bids to be received Mar. 1, '97, for $20,000 of 6% 20-yr. bonds. Rept. by Chn. Com., C. W. Gibson, Jan. 14, and unsigned, Feb. 4, '97.

9. **YAZOO CITY,** Yazoo Co. (3,286.) Built in '91 by Yazoo Improvement Co; put in operation Jan., '92. FRANCHISE.—25 yrs. from '91; provides for purchase of works by city after 10 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; 250,000 and 750,000 Laidlaw-Dunn-Gordon. Alabama bituminous coal used; av. cost, $3.30 per short ton, delivered. RESERVOIR.—Cap., 220,000 galls.; storage. TANK.—Cap., 158,640 galls.; iron; 30 × 30 ft., on hill. DISTRIBUTION.—Mains, 6 miles; cost extensions met by Co. on guarantee of revenue. Taps, 490; made by Co. for $7.50 for ½-in. Services, galv. i.; paid for by owner. Meters, 50; owned, controlled and repaired by Co. Yearly rental, $6 for ½-in. Use of meters optional with consumer. Hydrants, public, 53; private, 8. CONSUMPTION.—(Galls.) av., 660,000. PRESSURE.—Ordinary and fire, 110 lbs. MANAGEMENT.—Prest., S. V. Saleno; Secy. and Treas., H. B. Smith, both of Bay City, Mich.; Supt. and Ch. Pump. Engr., W. H. St. John. Rept. by Supt., June 13, '96. SEWERS.—Has sanitary sewers only.

LOUISIANA.

1. **ALEXANDRIA,** Rapides Co. (2,861.) Built in '95 by city; put in operation April 8. Contrs., Southern Electric Mfg. & Supply Co., New Orleans. SUPPLY.—Artesian well, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls; 2—1,000,000 Smith-Vaile dup. Wood used; av. cost, $2.00 per cord. STAND-PIPE.—Cap., 210,560 galls.; 16 × 140 ft. DISTRIBUTION.—Mains, 7 miles. Taps, 55; made for $6. Services, galv. i.; paid for by consumer. Meters, none; City can compel the use of meters and any consumer may have one. Hydrants, public, 65; private, 1. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $40,000. MANAGEMENT.—Mayor, Thos. Crawley; Chn. Com., E. J. Sullivan; Treas., James T. Flint; Supt., R. T. Thompson; Ch. Pump. Engr., J. W. Chamberlain. Rept. by Supt., June 22, '96. PROJECTED IMPROVEMENTS.—400,000-gall. reservoir. SEWERS.—None.

7. **ALGIERS,** (Station A, New Orleans P. O.), Orleans Co. See New Orleans.

2. **BATON ROUGE,** East Baton Rouge Co. (10,478.) Built in '88 by Baton Rouge Water Co. FRANCHISE.—60 yrs.; provides for purchase of works by city in 20 yrs. at actual value, determined by board of experts. Rates are not fixed in franchise, nor subject to regulation by city. Co. is exempt from local taxes for 10 yrs. City to pay $5,150 for public service. No legal difficulties. SUPPLY.—8-in. bored well, 750 ft deep, pumping to reservoir and stand-pipe. Supply formerly from Mississippi River, filtered by Jewell filters. PUMPS.—Cap., 3,000,000 galls.; comp. dup., 1,250,000, and high pressure, 1,750,000. Alabama or Pittsburg bituminous coal used; av. cost, $2.75 per short ton. RESERVOIR.—Cap., 500,000 galls.; storage. STAND-PIPE.—Cap., 182,200 galls.; steel, 15 × 100 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by earnings or assessments. Taps, 500; made by consumer for $2. Services, lead or galv. i.; paid for by consumer or owner. Meters, 50; owned by Co. or consumer; controlled and repaired by Co.; yearly rental, $3 for ¾-in. Use of meters compulsory for steam users, liveries, hotels. Co. can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 10. CONSUMPTION.—(Galls.) av., 500,000; max., 750,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $185,000. Cap. Stock: authorized, $100,000; all paid-up; paid 4% div'd in '95. Bonded debt, $85,000, at 6%; due 1908. Expenses, $10,600: Operating, $4,750; int., $5,100; taxes, $750. Revenue, $15,150: Consumers, $10,000; City, $5,150. MANAGEMENT.—Prest., William Garig; Secy., Treas. and Supt., John H. Wood; Ch. Pump. Engr., A. E. Finch. Rept. by Supt., June, '96. SEWERS.—None.

P 1. **CROWLEY,** Acadia Co. (420.) Town proposes to build works in '97. Engr., O. H. Landreth, Schenectady, N. Y. Supply, wells pumping to stand-pipe. Est. cost, $23,000. Rept. by Mayor, P. J. Chappins, Dec. 26, '96. Press rept., Dec. 12, '96, stated election had been called for Jan. 21, '97, to vote on above.

3. **DONALDSONVILLE,** Ascension Co. (3,121.) Built in '91 by city. SUPPLY.—Bayou La Fourche, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 1,500,000 Knowles comp. and 1,000,000 Barr comp. Pittsburg bituminous coal used. STAND-PIPE.—Cap., 33,840 galls.; iron; 8 × 90 ft. DISTRIBUTION.—Mains, 2½ miles. Taps, about 130; made by town, free. Services, galv. i.; paid for by consumer. Meters, 1; owned by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 35. PRESSURE.—Ordinary, 35 lbs.; fire, 70 lbs. FINANCIAL.—Expenses: Operating, $2,200. Revenue: Consumers, about $1,400. MANAGEMENT.—Rept. by Mayor, Paul Leche, Nov. 9, '96.

P 2. **FRANKLIN,** Saint Mary Co. (2,127.) Town proposes to build works. Engr., S. K. Felton, Atlanta. Supply, artesian well, lifted by 2—500,000-gall. dup. pumps to 12 × 120-ft. stand-pipe. Hydrants, 52. Rept. by Mayor, L. B. Tarlton, Nov. 17, '96. Press rept., Nov. 27, '96, stated town had voted to issue $25,000 6% bonds for above.

P 3. **HOUMA,** Terrebonne Co. (1,280.) Water and light plants under consideration, but nothing definite done. Rept. by Mayor, J. C. Dupont, Feb. 9, '97.

— ? **LAFAYETTE,** Lafayette Co. (2,106.) Dec. 23, '95, Robt. R. Zell, New Orleans, rept. he was making plans for works to be owned by city, with supply from artesian wells. Aug. 24, '96, Seckner Contracting Co., 79 Dearborn St., Chicago, rept. it had been awarded contract for water and electric light plant at $36,000.

4. **LAKE CHARLES,** Calcasieu Co. (3,442.) Built in '92 by Lake Charles Ice, Light & Water-Works Co.; put in operation in Oct. Engr., Thomas J. Bird, Vice-Prest. No Contr. FRANCHISE.—25 yrs. from '92; provides for purchase of works by city only after 25 yrs. Rates are subject to regulation by city as to maximum charges only. Co. is exempt from local taxes. City to pay $65 a yr. for each hydrant up to 40 in number; above that number $60 each. Contract independent of franchise and for 25 yrs. from '92. No legal difficulties. SUPPLY.—Calcasieu River, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Smedley dup. comp. Wood (pitch pine) used; av. cost, $2 per cord; half of the fuel free from cypress shingle mills. STAND-PIPE.—Cap., 185,000 galls.; steel; 16 × 110 ft., on solid brick foundation. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by earnings. Taps, 124; made for $1. Services, w. i.; paid for by consumer. Meters, 0. Hydrants, public, 69; private, 5. CONSUMPTION.—(Galls.) av., 800,000; max., 450,000; min., 200,000. PRESSURE.—Ordinary, 48 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $150,000; paid-up, $48,725. Debt, $18,560; all floating. Expenses: Operating, $3,469; int., $1,574; taxes, $742. Revenue: City, fire protection, and sewer flushing, $4,340; public buildings, $234. MANAGEMENT.—Prest., J. A. Landry; Vice-Prest. and Supt., Thomas J. Bird; Secy. and Treas., D. J. Landry; Ch. Pump. Engr., E. A. Bird. Rept. by Prest., June 24, '96. SEWERS.—None.

5. **MONROE,** Ouachita Co. (3,256.) Built in '93 by Monroe Water-Works & Light Co.; put in operation Aug. 3. Engr., Chas. H. Ledlie, St. Louis, Mo. No Contr. Combined water and electric light plant. Executive office is at Bennington, Vt. FRANCHISE.—30 yrs. from '92; provides for purchase of works by city after 10 yrs. and each 5 yrs. thereafter. Rates are required to be the average of New Orleans, Pine

Bluff, Ark., and Jackson, Miss. Co. is not exempt from local taxes. City to pay $40 per yr. for each hydrant. Contract for 30 yrs. if not purchased by city in 10 yrs. No legal difficulties. SUPPLY.—Artesian wells and Ouachita River, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,250,000 Worthington comp. non-cond.; 500,000 Gould triplex, spur-geared to Westinghouse slow speed motor. Arkansas run of mine bituminous coal used; av. cost, $3 per short ton, "on switch." RESERVOIR.—Cap., 900,000 galls.; storage. STAND-PIPE.—Cap., 180,000 galls.; iron; 16 × 120 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 9 miles. Taps, 321; made by Co., including ½-in. service to curb, for $6; ⅝-in., $7.50; ¾-in., for $10. Services, galv. l.; paid for by consumer. Meters: 3; owned and repairs paid by consumer; controlled by Co. Use of meters compulsory for manufacturers. Co. cannot compel and may prohibit use of meters. Hydrants, public, 76. CONSUMPTION.—(Galls.) av., 165,000. PRESSURE.—Ordinary, 55 lbs.; fire, 110 lbs. Two steam fire engines are held in reserve. FINANCIAL.—Cost, $125,000. Bonded debt, $100,000, at 6%; due in 1922. MANAGEMENT.—Prest., Wm. E. Hawks; Secy. and Mgr., S. B. Hawks, Bennington, Vt. Rept. by Mgr., Dec. 11, '96. SEWERS.—No sewers. REFERENCE.—Electric pumping plant, Eng. News, Sept. 26, '95.

P 4. **NATCHITOCHES,** Natchitoches Co. (1,820.) City expects to build works in '97, people having voted for same. Engr., J. A. Holmboe, Louisville, Ky. Supply, artesian wells, lifted by dup. pumps to 100,000-gall. steel tank. Hydrants, 30. Est. cost, $17,000. Repts. by Cy. Secy., J. C. Trichel, Jr., Dec., '96, and Jan., '97.

P 4½. **NEW IBERIA,** Iberia Co. (3,447.) Election was to be held Mar. 17, '97, to vote on 2½-mill tax for 10 yrs. for water and electric light plants. Mayor, Jno. Fisher; Secy., A. J. Cammack.

6, 7. **NEW ORLEANS,** Orleans Co. (242,039.)

NEW ORLEANS WATER-WORKS CO.

Now owned by New Orleans Water-Works Co.; built in '33 by Co., sold in '68 to city for $1,300,000; in '78 sold by city to New Orleans Water Co.; city owns a considerable amount of Co.'s stock. FRANCHISE.—50 yrs. from '78; provides for repurchase of works by city at end of 50 yrs. from '78, price to be fixed by five arbitrators; if city does not buy, franchise continues 50 yrs. longer. Rates are to be as those charged under city ownership. Co. is not exempt from local taxes. City to pay for hydrants at $60 each and for fire wells. LEGAL DIFFICULTIES.—See references below. SUPPLY.—Mississippi River, pumping to stand-pipe and direct. PUMPS.—Cap., 45,000,000 galls.: 2—10,000,000 Allis vert. triple exp.; Knowles. Pittsburg bituminous coal used; av. cost, $3.45 per short ton. STAND-PIPE.—Cap., 65,000 galls.; 8½ × 174 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 118 miles; cost extensions met by Co. on guarantee of revenue. Taps, 4,800. Services, lead; paid for by consumer. Meters, owned and repaired by consumer; controlled by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 1,749. CONSUMPTION.—(Galls.) av., 9,000,000; max., 13,000,000; min., 8,000,000. PRESSURE.—Ordinary, 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $2,645,000. Cap. Stock, $2,000,000; all paid-up; paid 5% div'd in '95. Debt, $730,000: Floating, $85,000; bonded, $645,000, at 5%. Expenses: Operating, $64,583; int., $38,752; taxes, $44,123, including $11,419 to State. Revenue: Consumers, $230,799. MANAGEMENT.—Prest., R. E. Craig; Secy., R. L. Macmurdo. Rept. by Supt., L. H. Gardner, June 8, '96. SEWERS.—Has storm sewers only. REFERENCES.—Eng. News, Apr. 23, '81; report of city surveyor on new supply, June 2, '77; seven years of litigation between city and Co., Sept. 7, '89; mechanical filters, Aug. 30, '94.

ALGIERS WATER-WORKS & ELECTRIC CO.

Built in '96. Des. Engr., Nesbitt Wingfield, Atlanta, Ga. Const. Engr., J. B. Craven, New Orleans. Contr., Howard Neely, Chattanooga, Tenn. Co. secured license to this territory from New Orleans Water-Works Co., and secured approval of city. District supplied is on west side of river, forming 5th Ward. FRANCHISE.—39 yrs. from '95. Rates are not fixed in franchise nor subject to regulation by city. Co. pays city and state taxes. City to pay $60 per yr. per hydrant, less 6%. Public buildings, free. LEGAL DIFFICULTIES.—None have arisen. SUPPLY.—Mississippi River, pumping to stand-pipe. PUMPS.—Cap., 6,000,000 galls. 2—3,000,000 Worthington comp. non-cond. Alabama and Pittsburg bituminous coal used; av. cost, $3 per short ton delivered. STAND-PIPE.—Cap., 180,480 galls.; steel; 16 × 120 ft. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 11 miles. Taps made by Co. for $3. Services, lead; paid for by consumer or house owner. Meters: 40. Hydrants, public, 200. CONSUMPTION.—(Galls) av., est., 40,000. PRESSURE.—Ordinary, 40 to 50 lbs; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, about, $75,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $100,000, at 6%; due Dec. 1, 1925, 30-yr. gold bonds. MANAGEMENT.—Prest., E. L. Bemiss; Vice-Prest., W. T. Hardie; Secy., Leigh Carroll; Supt., F. Olroyd. Rept. by Secy., June 22, '96. SEWERS.—Has partial system of storm sewers.

8. **PLAQUEMINE,** Iberville Co. (3,222.) Built in '93 by Co.; put in operation in Aug. Engr., W. L. Covel, Biloxi, Miss. FRANCHISE.—20 yrs. from '93. SUPPLY.—

Two bored wells, pumping to elevated tank. PUMPS.—Smedley. Pittsburg bituminous coal used; av. cost, $4 per short ton. TANK.—Cap., 25,000 galls.; cypress on elev. of 64 ft. FISCAL YEAR CLOSED July 31, '96. DISTRIBUTION.—Mains, 5¼ miles. Taps, 160; made by Co. Services, ¾-in.; paid for by consumer. Meters: 1; owned by Co. Use of meters compulsory for R. R. Co. Hydrants, public, 50; private, 1. CONSUMPTION.—(Galls.) av., 25,000; max., 50,000. PRESSURE.—Ordinary, 32 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $16,000. MANAGEMENT.—Prest., Fred. Wilbert; Secy., Dano Altemus; Supt. and Ch. Pump. Engr., Jas. Coleman. Rept. by Secy., Dec. 29, '96.

9. **SHREVEPORT,** Caddo Co. (11,979.) Built in '86-87 by Shreveport Water-Works Co. FRANCHISE.—30 yrs. SUPPLY.—Cross Bayou, pumping to settling basin and stand-pipe. PUMPS.—Cap., 2,000,000 galls.; four Blake, two comp. and two high-pressure. (Makers rept., 1,500,000-gall. Laidlaw-Dunn-Gordon erected in '93.) SETTLING BASIN.—Cap., 2,500,000 galls. FILTERS.—Cap., 1,000,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 258,000 galls.; iron; 20 × 110 ft. DISTRIBUTION.—Mains, 10 miles. Taps, 535. Meters, 14. Hydrants, 114. FINANCIAL.—Cost (in '87), $250,000. Bonded debt, $250,000; int., $15,000. Revenue: City, $9,120. SEWERS.—Has sewers. NOTE.—No official rept. since '90-1 Manual. Address H. H. Youree.

10. **THIBODAUX,** La Fourche Co. (2,078.) Built in '95 by town; put in operation Nov. 1. Engr., Geo. C. Morgan, Major Block, Chicago, Ill. Contrs., Howard De Long & Co., Lexington, Ky. SUPPLY.—Bayou La Fourche, pumping through 2—6-in. mains to stand-pipe. PUMPS.—Cap., 1,200,000 galls.; 2—600,000 Smith Valle comp. Av. cost of coal used, $3.75 per short ton. STAND-PIPE.—Cap., 98,000 galls.; steel; 12 × 116 ft., on brick foundation. FISCAL YEAR CLOSED Jan 1, '96. DISTRIBUTION.—Mains, 5 1-5 miles. Taps, 62; made by town for $1.50, paid to Engr. Services, ¾-in. galv. i.; paid for by consumer. Meters: 2; owned by consumer; controlled and repaired by city. Use of meters compulsory for large consumers and factories. Town can compel use of meters and any consumer may have one. Hydrants, public, 69; private, 5. CONSUMPTION.—(Galls.) av., 30,000; max., 45,000; min., 10,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. One steam fire engine is used in emergency. FINANCIAL.—Cost, $24,400. Expenses: Operating, $1,000. Revenue: Consumers, unmetered, $300; metered, $500; street sprinkling, $100. About $500 deficit met by taxation. MANAGEMENT.—Mayor and Supt., F. Zernott; Clerk, H. N. Coulon; Town Treas., P. L. Brand; Ch. Pump. Engr., Ed. Smithwick. Rept. by R. J. Naquin, Dec. 9, '96. SEWERS.—None. REFERENCE.—Stand-pipe, Eng. News, May 2, '95.

P 5. **WASHINGTON,** Saint Landry Co. (1,064.) Bonds for works authorized by popular vote. Engr., R. R. Zell, New Orleans. Supply, deep well and river, pumping to stand-pipe. Est., cost, $15,000. Repts. from officials Dec., '96, and Feb. 10, '97. Mayor, Aug. J. Mueller. Rept. later that bids for works would be received Mar. 16, '97.

TENNESSEE.

1. **ATHENS,** McMinn Co. (2,224.) Built in '88 by Athens Mining & Mfg. Co.; Jan., '97. Athens Water Co. was incorp. to take plant and enlarge it (rept. by Prest., Jan., '97). SUPPLY.—Spring, pumping to stand-pipe. DISTRIBUTION.—Mains, 8 miles. FINANCIAL.—Cost, $35,000. No debt. MANAGEMENT.—Prest., W. C. Hornsby; Secy. and Treas., B. J. Hornsby; Mgr., J. A. Dacus. Rept. by Secy., Sept. 25, '96.

2. **BRISTOL,** Sullivan Co. (3,324.) Built in '88-9 by Bristol-Goodson Water Co. Supplies Goodson, Va. FRANCHISE.—Exclusive until 1906. Co. is not exempt from local taxes. City to pay $40 each for first 25 hydrants and $35 each for next 15. No legal difficulties. SUPPLY.—Kings Spring, pumping from impounding reservoir to tank. PUMPS.—Cap., 1,920,000 galls.; 1,200,000 and 720,000 Blake. Bituminous coal used; av. cost, $1.25 per short ton delivered. RESERVOIRS.—Cap., 4,400,000 galls.; 4,000,000 impounding and 400,000 collecting. TANK.—Cap., 100,000 galls.; wood, 24 ft. high on brick tower 50 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by earnings. Taps, 475; made by consumer. Services, lead and iron; paid for by consumer. Meters: 1; owned, controlled and repaired by consumer. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 400,000; max., 500,000; min., 300,000. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cap. Stock: Authorized, $75,000; all paid-up. Bonded debt, $40,000, at 6%; due 1919. Expenses, taxes, $360. MANAGEMENT.—Prest., Saml. L. King; Secy., B. G. McDowell; Treas., W. C. Arrison; Supt., R. L. Blevins; Ch. Pump. Engr., Jos. Daniel. Rept. by Prest., June 6, '96. SEWERS.—Has partial systems of sanitary and storm sewers.

3. **BROWNSVILLE,** Haywood Co. (2,516.) Built in '94 by city. Engr., W. F. Carloss. Contrs., Carloss Well Co. SUPPLY.—Two 8-in. deep wells, pumping directly to reservoir. PUMPS.—Two Worthington, one a 500,000-gall. simple high pressure. Wood used as fuel. RESERVOIR.—12 × 30 ft., × 12 ft. deep. DISTRIBUTION.—Mains, 4 miles; cost extensions met by water rents. Taps, 150; made by city, free. Services, galv. and black i.; paid for by consumer. Meters, 0. Hydrants, public, 40. PRESSURE.—Ordinary,

40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $12,000, at 6%; due in 25 yrs. with privilege of retiring at pleasure. Expenses: Operating, $1,800. Revenue: City, fire protection, $1,200; other purposes, $2,040. No deficits. MANAGEMENT.—Mayor and aldermen. Recorder acts as Secy. and Supt. Rept. by Geo. I. Currie, Dec. 11, '96. SEWERS.—None.

4, 5. **CHATTANOOGA**, Hamilton Co. (29,100.)

CITY WATER CO.

Owned by American Water-Works & Guarantee Co., Pittsburg, under name of City Water Co. Built in '64 by U. S. Government; purchased soon after by private Co., who sold plant to Lookout Water Co. Mountain Springs Water Co. built works later. City Water Co. purchased both plants in '87 for $400,000 and rebuilt the works in '87-8. Supplies Ridgedale. FRANCHISE.—Does not provide for purchase of works by city. Max. rates are fixed in franchise. SUPPLY.—Tennessee River, by pumping. PUMPS.—Cap., 17,000,000 galls.; 5,000,000 Deane, 8,000,000 Worthington hor. comp. high duty, 4,000,000 Knowles. (Makers rept. 400,000 Allis hor. geared.) FILTERS.—Cap., 9,000,000 galls.: 6,000,000 National (New York); 3,000,000 Jewell. RESERVOIRS.—Cap., 3,000,000 galls. STAND-PIPE.—Cap., 236,880 galls.; 24 × 70 ft. DISTRIBUTION.—Mains, 78 miles. PRESSURE.—Ordinary, 90 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., James S. Kuhn, McKeesport, Pa.; Secy. and Treas., A. E. Claney; Supt., C. D. Barstow. Rept. by Am. W.-Wks & Guar. Co., Pittsburg, Pa., Aug. 20, '96. SEWERS.—Has sewers. REFERENCES.—Eng. News, Dec. 30, '82; Jewell filters, May 28, '96.

CHATTANOOGA WATER & POWER CO.

Built in '89 and enlarged in '90 by Debenture Guarantee & Assurance Co., Chicago, Ill. SUPPLY.—City Water Co.'s mains, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Worthington. STAND-PIPE.—Cap., 150,000 galls. 15 × 100 ft., on Cameron Hill. DISTRIBUTION.—Mains, 2.5 miles. FINANCIAL.—Cost, $100,000. Bonded debt, $75,000, at 6%. NOTE.—Request for information returned unsigned, stating that "the Chattanooga Water & Electric Co. has been in the hands of a receiver for nearly two years;" no further information given. Press repts., latter part of '96 and early in '97, indicate that but few families are supplied; also that owners proposed to close down works, but were prevented by preliminary injunction.

6. **CLARKSVILLE**, Montgomery Co. (7,924.) Bought by the city July 1, '96; built in '79 by Travers Daniels and sold to Clarksville Water Co. in '83. SUPPLY.—Cumberland River, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; Blake, 500,000; Deane, 500,000; Gordon, 750,000. A 1,500,000-gall. Worthington vert. comp. cond. pump is under contract. Pea coal used; av. cost, 6½ cts. per bushel. STAND-PIPE.—Old: Cap., 132,000 galls.; iron; 15 × 100 ft., 275. ft. above pumps. New: Cap., 367,000 galls.; 25 × 100 ft.; erected in '97. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 12 miles. Taps, 528; made by consumer; $1 paid to city for use of tapping machine. Services, w. i.; paid for by consumers. Meters, 0. Hydrants, public, 97. CONSUMPTION.—(Galls.) av., 500,000; max., 600,000; min., 400,000. PRESSURE.—Ordinary and fire, 55 lbs. Steam fire engines are used. FINANCIAL.—Cost, $60,000. MANAGEMENT.—Supt., R. E. McCulloch; Ch. Pump. Engr., A. C. Smith. Rept. by Supt., July 15, '96. SEWERS.—Has sanitary and storm. REFERENCE.—Eng. News, May 13, '82.

7. **CLEVELAND**, Bradley Co. (2,863.) Built in '95 by National Water-Works & Construction Co., of Pittsburg, under name, Cleveland Water & Light Co.; put in operation Sept. 1. Engr., W. W. Cunningham, Pittsburg. FRANCHISE.—20 yrs. from '95. Provides for purchase of works by city every 5 yrs., price to be determined by arbitration. Rates are not subject to regulation by city. Co. not exempt from local taxes. City to pay $55 per hydrant per yr. LEGAL DIFFICULTIES.—Press repts., in '96-7, state that city has refused to pay hydrant rental from start, and that Co. has offered to sell to city; also that matter would go to courts. SUPPLY.—Spring, pumping direct. PUMP.—Cap., 1,500,000 galls:; Hughes. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 6 miles. Taps, 250; made by company. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 40; private, 1. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jos. T. Nevin, Pittsburg; Secy., R. J. Cunningham. Rept. by Mgr., W. W. Cunningham, Sept. 8, '96.

8. **COLUMBIA**, Maury Co. (5,370.) Now owned by Columbia Water Co. In '40 city built works; in '84 it sold them to Columbia Improvement Co.; Feb. 16, '96 works come under control of above Co. (evidently as result of court sale.—Ed.) FRANCHISE.—50 yrs. from '83; provides for purchase of works by city each 10 yrs., price to be appraised. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $3,950 per yr. for public service and additional hydrants at $30 each. No legal difficulties. SUPPLY.—Duck River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 1—1,000,000 Dean tandem dup. and 1—1,000,000 Blake. Bituminous coal used; av. cost, $2.30 per short ton. RESERVOIRS.—Cap., 2,000,000 galls.; two 1,000,000. FISCAL YEAR CLOSED Dec. 1, '96. DISTRIBUTION.—Mains, not given; cost exten-

sions met by Co. Taps, 300; made by Co. for $3. Services, iron; paid for by consumer from sidewalk. Meters, 16; owned, controlled and repaired by Co.; yearly rental, $3. Use of meters optional with Co.; compulsory for mills, livery stables and manufacturers. Hydrants, public, 71; private, 3. CONSUMPTION.—(Galls.) av., 400,000; max., 500,000; min., 300,000. PRESSURE.—Ordinary, 90 lbs.; fire, 140 lbs. FINANCIAL.—Cap. Stock: Authorized, $60,000; all paid-up. Bonded debt, $60,000, at 6%; due 30 yrs., from Apr., '96. No sinking fund. Expenses, $10,600 (?): Operating, $6,000; int., $3,600 (?); taxes, $1,000. Revenue: City, fire protection, $3,950; sewer flushing and public buildings, free. MANAGEMENT.—Prest., Chas. E. Bigelow; Secy. and Treas., W. P. Parrish, both of New York. Rept. by Supt., W. W. Moore, Jan. 18, '97. PROJECTED IMPROVEMENTS.—Extension of intake pipe. SEWERS.—Has partial sanitary and storm sewers. REFERENCE.—Eng. News, May. 13, '82.

9. **DYERSBURG,** Dyer Co. (2,009.) Owned by Dyersburg Water & Electric Light Co. Built in '89 by F. Shepard. Press rept., Feb., '97, stated bill would be introduced in legislature authorizing people to vote bonds to buy and extend water and light plants, or build new systems. SUPPLY.—River, pumping to tank. PUMPS.—Cap., 150,000 galls.; Laidlaw & Dunn dup. TANK.—Cap., 48,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 131. Meters, 6. Hydrants, 10. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 20 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $10,000. No debt. Expenses: Operating, $580. Revenue, $4,500: Consumers, $4,000; City, $500. NOTE.—No rept. since '90-1 Manual.

10. **GREENEVILLE,** Greene Co. (1,779.) Built in '95 by H. Reaves; put in operation Aug. 1, '95. Engr., H. Reaves. FRANCHISE.—15 yrs. from '95. Plant is exempt from local taxes for 5 yrs. SUPPLY.—Spring, by gravity and pumping. PUMPS.—Cap., 600,000 galls.; Stillwell-Bierce dup. Bituminous coal used; av. cost, $1.65 per short ton. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by owner. Taps made by Co. Services, steel; paid for by consumer. Co can compel the use of meters and any consumer may have one. Hydrants, public, 16. CONSUMPTION.—Small. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $4,500. Expenses: Operating, $760. MANAGEMENT.—Rept. by Owner, June 25, '96. PROJECTED IMPROVEMENTS.—100 tons of pipe and 15 hydrants. SEWERS.—None.

11. **GREENFIELD,** Weakley Co. (801.) Built in '95 by Greenfield Water-Works Co.; put in operation in July. Engr., S. J. Hillis. FRANCHISE.—Rates are subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Two 6-in. wells, 200 ft. deep. PUMPS.—Cap., 200,000 galls.; 2—100,000. Wood used; av. cost, $1.50 per cord. TANK.—Cap., 20,000 galls.; on tower 50 ft. high. FISCAL YEAR CLOSED July 1, '96. DISTRIBUTION.—Mains, about 3 miles; cost extensions met by Co. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 6; private, 4. CONSUMPTION.—(Galls.) av., 50,000; max., 100,000; min., 20,000. FINANCIAL.—Cost, $6,500. Cap. Stock: Authorized, $5,500; all paid-up. No div'd in '96. Floating debt, $1,000, at 6%. Expenses: Operating, $600. MANAGEMENT.—Prest., B. T. Allen; Secy., Supt. and Treas., J. W. Forbis; Ch. Pump. Engr., Wm. Tomlinson. Rept. by Co., Dec. 29, '96. SEWERS.—None.

D 1. **HALLS,** Lauderdale Co. (Not given.) Under construction in '96 by town. Contrs., Corliss Well Co., Memphis. Supply, driven well, 170 ft. deep, lifted by 18,000-gall. dup. well pump to 15,000-gall. elevated tank. Rept. by T. F. Hall, Jan. 23, '97. No sewers.

12. **HARRIMAN,** Roane Co. (716.) Built in '94 by village; put in operation in July. Engr., G. W. Pearsall; Contr., H. W. Veazey. Small temporary works for general supply built in '91 by East Tennessee Land Co.; water was supplied free. SUPPLY.—Emory River, pumping to distributing reservoir, thence by gravity. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Laidlaw-Dunn-Gordon comp. dup. Brushy Mt. mine run bituminous coal used; av. cost, 95 cts. per short ton, delivered. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 9 miles; cost extensions met by advance payments on water rents almost entirely. Taps, 340; made by city. Services, w. i.; paid for by owner. Meters, 0. City can compel use of meters and any consumer may have one. Will probably adopt for manufacturers in near future. Hydrants, 49. CONSUMPTION.—(Galls.) av., 350,000. PRESSURE.—Ordinary, 100 lbs.; fire, 140 lbs. FINANCIAL.—(Water and light plants combined.) Cost, $73,350. Bonded debt, $91,500, at 6%. Expenses, Operating, $3,742. Deficits met by taxation. MANAGEMENT.—Supt., Thos. Brown. Rept. by Clk., D. W. Thomas, June 20, '96. SEWERS.—None.

13. **HUMBOLDT,** Gibson Co. (1,837.) Built in '95-6 by city; put in operation Feb. 1. Engr., S. C. Lancaster, Jackson; Contrs., G. C. Anderson & Co., Jackson. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Snow comp. dup. Bituminous nut coal used; av. cost, $2.75 per short ton. DISTRIBUTION.—Mains, 3 miles. Taps, made for $2. Services, iron or lead; paid for by property owner. Hydrants, public, 19; private, 1. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. MANAGEMENT.—Supt., T. G. Seales. Rept. by G. C. Anderson & Co., Jackson, Dec. 11, '96. SEWERS.—None.

14. **JACKSON,** Madison Co. (10,039.) Built in '85 by city. SUPPLY.—Tennessee River, pumping to reservoir. Press rept., Apr., '93, stated 10 of 21 proposed driven

wells had been completed, and referred to old wells in use. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Knowles comp. dup. Bids were received Aug. 5, '95, for 3,000,000 pump. DISTRIBUTION.—Mains, 14 miles. Taps, 767. Meters, 5. Hydrants, 157. FINANCIAL.—Cost, $110,111. Bonded debt, $100,000 at 6%, due 1915. Expenses, $12,450: Operating, $6,450; int., $6,000. Revenue, Consumers, unmetered, $9,175. NOTE.—No official report since '90-1 Manual, except from S. C. Lancaster, City Engr. and Secy. W.-W., regarding bids for new pump. SEWERS.—Has sewers.

15. **JOHNSON CITY,** Washington Co. (4,161.) Built in '90-1 by Watauga Water Co.; put in operation July 1. CHARTER.—20 yrs. Rates are fixed in charter. No legal difficulties. SUPPLY.—Springs at Buffol Mt., by gravity. RESERVOIR.—Cap., 10,000,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by cash. Taps, 249; made by Co. at $5 for ½ and ¾-in.; $7.50 for 1-in., and $10 for 1¼-in. Meters, 0. Hydrants, public, 52; private, 8. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cap. Stock: Authorized, $200,000. Bonded debt, $100,000, at 6%. Expenses: Operating, $1,200; taxes, $275. Revenue, City, fire protection, $2,040. MANAGEMENT.—Prest., W. A. Jeter; Secy. and Supt., C. W. Battle; Treas., A. E. Boardman. Rept. by Supt., Aug. 4, '96. SEWERS.—None.

16. **KNOXVILLE,** Knox Co. (22,535.) Built in '83 by Knoxville Water Co. Supplies North and West Knoxville. FRANCHISE.—30 yrs. from '83; provides for purchase of works by city in 15 yrs. from June, '83. Rates not subject to regulation by city. SUPPLY.—Tennessee River, pumping to reservoir and stand-pipe. PUMPS.—Cap., 7,500,000 galls.; 2—1,250,000 Davidson comp.; 5,000,000 vertical direct acting and 2,300,000 comp. cond. dup. Deane, latter for high service, only. Nut and pea coal used; av. cost, $1.25 to $1.50 per short ton. FILTERS.—Cap., 5,000,000 galls.; Warren. RESERVOIRS.—Cap., 3,000,000 galls. STAND-PIPE.—Cap., 511,445 galls:; steel; 32 × 85 ft., on brick and concrete foundation; built by E. Hodge & Co., East Boston, Mass., in '94. FISCAL YEAR CLOSED Mar. 30. DISTRIBUTION.—Mains, 44 miles. Taps, 2,166; made by Co. for $10 in paved street; $5 in others, including service to street line. Services, galv. L.; paid for by consumer. Meters, 167; owned by Co. and consumers; controlled by Co.; repairs paid by one at fault; yearly rental, $2 for ½-in., to $16 for 4-in. Use of meters compulsory for manufacturers, hotels, elevators and mechanical establishments. Co. can compel use of meters and any consumer may have one under certain conditions. Hydrants, public, 203; private, several. CONSUMPTION.—(Galls.) av., 1,931,891; max., 2,176,816; min., 1,644,875. PRESSURE.—Ordinary, 35 to 85 lbs.; fire, 35 lbs. additional. Steam fire engines are used. FINANCIAL.—Cost, $1,201,676. Cap. Stock: Common, paid-up, $632,500; pref'd, paid-up, $293,000. Bonded debt, $150,000, at 6%, first mortgage bonds; $85,000, at 6%, debenture notes. Sinking Fund, invested in bonds of Co. MANAGEMENT.—Prest., William Wheeler; Treas., Elbert Wheeler, both of Boston, Mass. Supt., William H. Hague; Ch. Pump. Engr., John A. Durham. Rept. by Wm. Wheeler, Supervising Engr., Oct. 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Mar. 28, '85; breaks in reservoir, Feb. 23, '84.

17. **LEBANON,** Wilson Co. (1,883.) Construction begun by city in Jan., '97. Engr., J. J. Hatcher. No contr. PUMP.—Cap., 360,000 galls. STAND-PIPE.—Cap., 63,000 galls.; 12 × 75 ft. DISTRIBUTION.—Mains, ¾ mile. Hydrants, public, 14. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 65 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $2,200. MANAGEMENT.—Prest., B. W. Cox; Secy., W. M. Hannah; Treas., Dr. Heidellson; Supt., J. J. Hatcher. Rept. Jan. 18, '97.

18. **LENOIR CITY,** Loudon Co. (Not given.) Built in '94 by Lenoir City Co.; put in operation in Oct. SUPPLY.—Large flowing spring, pumping to reservoir. PUMP.—Laidlaw-Dunn-Gordon. Bituminous coal used; av. cost, $1.85 per short ton. RESERVOIR.—Cap., 500,000 galls.; 190 ft. above business part of town. DISTRIBUTION.—Mains, 2 miles. FINANCIAL.—No debt. Expenses: Operating, $540. MANAGEMENT.—Rept. by Saml. Marfield, Sept. 14, '96.

D 2. **MANCHESTER,** Coffee Co. (621.) Built for domestic use in '89 by J. E. Thompson; purchased in '91 by R. L. Wolfe, Evansville, Ind. Supply, spring, pumping direct. Mains, 2 miles. Taps, 80. Consumption, 35,000 galls. Purchase price, $7,000. Cap. Stock, $6,000; paid 20% div'd in '90. No debt. Expenses, $290. Revenue, $1,680. No rept. since '90-1 Manual.

P 1. **MARTIN,** Weakley Co. (1,490.) City proposes to secure authority to issue bonds for works. No Engr. yet. Supply, deep well, pumping to stand-pipe. Est cost, $15,000 to $18,000. Rept. by Mayor, J. E. Kennedy, June 20, '96. Press rept. in Mar., '97, stated authority to build had been secured.

19. **MEMPHIS,** Shelby Co. (64,495.) Owned by Artesian Water Co. since '88; built in '72 by Co., which sold to Artesian Water Co. in '88. FRANCHISE.—20 yrs. from '88; provides for purchase of works by city after 9 yrs. Rates are fixed in franchise as those of Kansas City, Atlanta and Nashville. City contract for 20 yrs. No legal difficulties. SUPPLY.—Artesian wells, pumping direct and to stand-pipe. Wells are connected by tunnel ¾ mile, or more, in length. PUMPS.—Cap., 30,000,000 galls.; 3—10,000,000 Worthington vert. high duty comp. Kentucky nut bituminous coal used; av. cost, $1.80

per short ton. STAND-PIPE.—Cap., 387,750 galls.; 20 × 165 ft.; 1¼ to ⅛-in. steel plates. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 70 miles; cost extensions met by profits. Taps, 6,500; made by Co. free within city limits. Services, lead and iron; paid for by Co. within city limits. Meters, 300; owned, controlled and repaired by Co. Co. put meters only on services of large consumers who would pay $50 a year by estimate. Hydrants, public, 400. CONSUMPTION.—(Galls.) av., 9,000,000. PRESSURE.—Ordinary, 50 lbs. Steam fire engines are used. FINANCIAL.—Cost, about $2,000,000. Cap. Stock: Authorized, $1,100,000. Bonded debt, $750,000, at 5%. MANAGEMENT.—Prest. (press rept. of election in '97), T. J. Latham; Secy., Lawrence Simpson; Treas., G. W. Macrae; Street Supt., A. A. Tucker; Ch. Pump. Engr., Chas. H. Smith. Rept. by Secy., June 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Dec. 17, '81; Worthington pumps, Sept. 12, '91; artesian wells and stand-pipe, Sept. 14, '93.

—? **MILAN,** Gibson Co. (1,546.) Built in '96 by W. F. Corless & Co., Memphis (for general supply?). Water is pumped. Owners wish to sell or rent plant. Rept. by W. G. Harrison, Nov., '96.

20. **MORRISTOWN,** Hamblen Co. (1,999.) Built in '96 by city; put in operation March 23. Engr., J. L. Ludlow, Winston, N. C. Contr., J. N. Haslehurst, Atlanta, Ga. SUPPLY.—Two large springs, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Smith-Vaile. Bituminous coal used; av. cost, $1.80 per short ton. RESERVOIRS.—Cap., 1,000,000 galls.; distributing; 250 ft. above pumping station. DISTRIBUTION.—Mains, 7 miles. Taps, 100; made by city for $5. Services paid for by consumer. Meters, 0. Hydrants, public, 23; private, 1. PRESSURE.—Ordinary, 105 lbs. FINANCIAL.—Cost, $48,000. Floating debt, $40,000. Expenses: Operating, est., $960. Deficits met by special water tax. MANAGEMENT.—Prest., R. F. Taylor; Secy., Geo. S. Crouch. Rept. by Supt., John Sharp, June 22, '96. SEWERS.—None.

21. **MURFREESBORO,** Rutherford Co. (3,739.) Built in '90 by Murfreesboro Water-Works Co.; put in operation April 1. Fire protection system built by town in '88. FRANCHISE.—33 yrs. from '89. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,470 for public service. No legal difficulties. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; three McGowan; 750,000 Laidlaw-Dunn-Gordon. Sewanee bituminous coal used; av. cost, $1.75 per short ton. STAND-PIPE.—Cap., 70,512 galls.; steel; 10 × 120 ft., on hill 25 ft. above city. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by earnings. Taps, 362; made by consumer for $2.50 to $3.50. Services, lead and brass; paid for by consumer. Meters, 1; owned, controlled and repaired by Co. Co. expect to introduce 50 meters this year. Hydrants, public, 43; private, 1. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $38,000. Cap. Stock: Authorized, $50,000; all paid-up; paid 4% div'd in '95. Floating debt, $15,475, at 6%. Expenses: Operating, $2,000. Revenue, $5,356: Consumers, unmetered, $3,850; metered, $36; City, fire protection, $1,350; street sprinkling, $120. MANAGEMENT.—Prest., Treas. and Supt., J. E. Thompson. Rept. by Supt., June 8, '96. SEWERS.—None.

22. **NASHVILLE,** Davidson Co. (76,168.) Built in '32 by city. SUPPLY.—Cumberland River, pumping to reservoir (3 × 114-ft. stand-pipe, incased in brick, previously reported). PUMPS.—Cap., 30,000,000 galls.; 2—10,000,000 Worthington and 1—10,000,000 Holly vert. high duty. St. Bernard (Ky.) mine run bituminous coal used; av. cost, $1.92½ per short ton. FILTERS.—Cap., 10,000,000 to 20,000,000 galls.; filter gallery in river. RESERVOIR.—Cap., 51,000,000 galls.; 308 ft. above river. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 65 miles; cost extensions met by sale of bonds. Taps, 8,140; made by city for $3. Services, lead; paid for by property owner. Meters, 1,925; owned by city or consumer; controlled and repaired by city. City can compel use of meters at its expense and any consumer may have one. Hydrants, public, 520; private, 30. CONSUMPTION.—(Galls.) av., 12,204,576; max., 14,710,505; min., 11,236,316. PRESSURE.—Ordinary, 80 to 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,429,051. Bonded debt, $1,497,000, at 4, 5, 5½ and 6%. Expenses: Operating, $61,486; int., $70,000. Revenue: Consumers, unmetered, $50,927; metered, $62,152; City, none. Deficit of $19,820 in '95. MANAGEMENT.—Geo. W. Stainback; Supt., Geo. Reyer; Ch. Pump. Engr., Wm. Tolmie. Rept. by Supt., June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Dec. 10, '81; new storage reservoir, June 16, '88; laying submerged pipe, Aug. 8, '91.

—? **NEWBERN,** Dyer Co. (1,286.) Dec. 12, '92, E. E. Davis rept. that Newbern Water, Light & Power Co. would start electric light plant by Jan. 1, '93, and water-works by June 1, '93. Dec., '96, citizen rept. that Newbern had water-works, owned by town, with H. J. Swindler, Mgr.

16. **NORTH KNOXVILLE** (P. O. Knoxville), Knox Co. (2,297.) See Knoxville.

23. **PARIS,** Henry Co. (1,917.) Built in '95-6 by city; put in operation Jan. 16. Engrs. and Contrs., Guild & White, Chattanooga. SUPPLY.—Deep wells, pumping to reservoir and tank. PUMPS.—Smith-Vaile and Bacon air lift. Washed slack bituminous coal used; av. cost, $1.80 per short ton. RESERVOIR.—Cap., 125,000 galls. TANK.—

Cap., 86,000 galls.; on steel trestle 75 ft. high. DISTRIBUTION.—Mains, 5 miles. Taps, 125; made by city for $5, including service to curb. Services, lead and galv. i.; paid for by consumer. Meters, 5; owned and repaired by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Rept. by Secy. and Supt., E. E. Davis, Aug., '96. SEWERS.—None.

24. **PULASKI,** Giles Co. (2,274.) Built about '93 (?). Rept. by F. M. Bunch. Press rept., Nov., '93, stated B. S. T. Dobree had bought works from "old owners, the City Water Co."

4. **RIDGEDALE,** Hamilton Co. (1,254.) Supply from Chattanooga.

—? **RIPLEY,** Lauderdale Co. (682.) Press rept., Dec., '93, stated: "Ripley has now in operation one of the best systems of water-works in West Tennessee." No further information can be obtained.

25. **SEQUACHIE,** Marion Co. (Not given.) In '90 Sequachie Town & Improvement Co. made contract with G. Sherman to put in water-works. Temporary supply, for domestic use only, was introduced in '90, probably; complete plant put in operation in fall of '91. FRANCHISE.—20 yrs. from '91; provides for purchase of works by city at expiration of franchise. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Mountain springs, by gravity. DISTRIBUTION.—Mains, 3 miles. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $5,000. MANAGEMENT.—Rept. by G. Sherman, June 6, '96. SEWERS.—None.

26. **SHELBYVILLE,** Bedford Co. (1,823.) Built in '94 by National Water-Works & Constn. Co.; put in operation in April; Engr., W. W. Cunningham, Cleveland. FRANCHISE.—20 yrs. from '94. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Duck River, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Gordon. Bon Air mine run bituminous coal used; av. cost, $1.75 per short ton, delivered. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 3 miles. Taps, 112; made by Co. Services, paid for by owner at 25 cts. per ft. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 29. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Revenue, City, fire protection, $1,768. MANAGEMENT.—Secy., R. J. Cunningham. Rept. by Supt., A. A. McCorkle, Pittsburg, Pa., Nov. 2, '96. PROJECTED IMPROVEMENTS.—Stand-pipe and filter. SEWERS.—None.

27. **SOUTH PITTSBURG,** Marion Co. (1,479.) Built in '78 by Southern Coal, Iron & Land Co.; transferred to South Pittsburg City Water Co. July 6, '90. FRANCHISE.—Rates are fixed in franchise and subject to regulation by city. SUPPLY.—Mountain springs, from impounding reservoir, by gravity and pumping from Tennessee River. PUMP.—Cap., 1,000,000 galls.; Woodward dup. RESERVOIR.—Cap., 35,000 galls.; available only during rainy season. DISTRIBUTION.—Mains, 4 miles. Taps, 3,000. Services, w. i. Meters, 0. Hydrants, public, 8; private, 5. PRESSURE.—Ordinary, 60 to 70 lbs.; fire, 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by South Pittsburg City Water Co. per Fred Wiesener.

—? **TRENTON,** Gibson Co. (1,693.) Press rept., May 27, '96, stated Trenton Water-Works Co. had been incorp. by A. E. Drinkwater, J. R. Walker and others. June, '96, W. J. Freeman wrote: "Address Supt. W.-W.; it is done by private firm." Jan. 12, '97, makers rept. 500,000-gall. Worthington simple high pressure pump as recently contracted for. Press rept., Feb., '97, stated city has applied to legislature for authority to issue $25,000 bonds for works.

28. **UNION CITY,** Obion Co. (3,441.) Built in or prior to '95 by city. Engrs., Guild & White, Chattanooga. SUPPLY.—Deep wells, by pumping. There is a well 20 ft. diam. by 40 ft. deep; 18-in. brick wall laid in cement, which is probably a receiving well. PUMPS.—Cap., 2,000,000 galls.; 1,000,000—Dean and 1,000,000—Knowles. Bituminous coal used; av. cost, $2 per short ton. DISTRIBUTION.—Taps, 360; made by city for $4. Meters, 0. Hydrants, public, 80. PRESSURE.—Ordinary, 35 lbs.; fire, 80 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Supt., W. L. Alexander. SEWERS.—None.

16. **WEST KNOXVILLE** (P. O., Knoxville.), Knox Co. (2,114.) See Knoxville.

KENTUCKY.

1. **ASHLAND,** Boyd Co. (4,195.) Built in '90-1 by Ashland Water Supply Co. Press rept., Mar., '96, stated works had been bought at sale by trustees for bondholders at $67,000. FRANCHISE.—20 yrs. City to pay $4,000 for 90 hydrants per yr.; $40 for each additional. SUPPLY.—Ohio River and driven wells on its bank, pumping to reservoir. PUMPS.—Cap., 4,000,000 galls.; four 1,000,000 Deane vertical high-pressure. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 9½ miles. Taps, 600. Services, lead. Hydrants, public, 90. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—

Ordinary, 100 lbs. FINANCIAL.—Cost, $110,000. Cap. Stock, authorized, $250,000; all paid-up. Bonded debt, $75,000, at 6%. Revenue, $4,000. MANAGEMENT.—Prest., John M. Gardiner. NOTE.—Above figures are those given in '90-1 Manual. Later information refused. REFERENCE.—Reservoir, Eng. News, Apr. 11, '91.

20. **AUDUBON** (P. O., Henderson.), Henderson Co. (693.) Supply from Henderson.

2. **BELLEVUE** (P. O., Newport.) **AND DAYTON,** Campbell Co. (Bellevue, 3,168.) Dayton, 4,264.) Built in '87 by Bellevue Water & Gas Co. SUPPLY.—Newport Water-Works, under 25-yr. contract at 7c. per 1,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 16 miles. Taps, 1,800. Services, lead. Meters, 2. Hydrants, public, 200. FINANCIAL.—Cost, $190,000. Cap. Stock, $250,000. Bonded debt, $100,000, at 6%. Expenses: Operating, $6,000. Revenue, $23,000: Consumers, $16,000; City, fire protection, $7,000. MANAGEMENT.—Prest. and Mgr., G. R. Harms; Secy., Mahlon M. Harms.

3. **BOWLING GREEN,** Warren Co. (7,803.) Built in '68 by town. SUPPLY.—Barren River, pumping to reservoir. PUMPS.—Cap., 3,000,000 galls.; 2,000,000 comp. cond., make not given; 1,000,000 Worthington non-comp. non-cond. Nut or mine run bituminous coal used; av. cost, $1.25 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; 237 ft. above pumps. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, not given; cost extensions met by rentals. Taps, 1,500; made by city, free, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters: 50; owned, controlled and repaired by city. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 110. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost (in '87), $100,000. Bonded debt, $60,000 at 6%. Expenses, Operating, $4,000. Revenue (in '90): Consumers, $11,062. MANAGEMENT.—Mayor, John H. Mallory; Secy., G. S. Hollingsworth; Treas., J. E. Potter; Supt., Jas. H. Wilkerson; Ch. Pump. Engr., Owen Nugent. Rept. by Supt., Sept. 30, '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Nov. 25, '82.

4. **BURNSIDE,** Pulaski Co. (Est., 700.) Construction begun June 1, '94, by Burnside Water Co.; put in operation Sept. 1, '96. Engr., John S. Geary. No Contr. FRANCHISE.—Perpetual. City to pay for 15 hydrants at $30 each per yr.; additional, $50 each. Hydrants 400 ft. apart. SUPPLY.—Big South Fork of Cumberland River, pumping to reservoir. PUMPS.—Cap., 575,000 galls.; Deane dup. RESERVOIR.—Cap., 250,000 galls.; 60 ft. in diam., 16 ft. deep. DISTRIBUTION.—Mains, 2 miles. Taps, 30. Meters, 8. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 6,000. PRESSURE.—Ordinary and fire 110 lbs. FINANCIAL.—Cost, $12,000. Cap. Stock: Authorized, $6,000; paid-up, $4,500. Bonded debt, $7,500 at 6%. Expenses: Operating, $150; int., $450. Revenue, $1,050: Consumers, $600; City, $450. MANAGEMENT.—Prest., C. W. Cole; Secy., A. B. Massey; Treas., A. C. French. Rept. by Prest., Jan., '97. SEWERS.—None.

5. **CARROLLTON,** Carroll Co. (1,720.) Built in '95 by city; put in operation Nov. 1. Engr., G. W. Persall, Harriman, Tenn. Contrs., Guild & White, Chattanooga, Tenn. SUPPLY.—Ohio River, pumping to reservoir. PUMP.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon. RESERVOIR. — Cap., 1,000,000 galls. DISTRIBUTION. — Taps, 150; made by city at $5 for ½-in.; $6 for ¾-in.; $7 for 1-in. City can compel use of meters and any consumer may have one. Hydrants, 34. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $23,000. MANAGEMENT.—Rept. by Supt., J. R. Corn, Oct. 6, '96. SEWERS.—None.

6. **CATLETTSBURG,** Boyd Co. (1,874.) Built in '91 by Catlettsburg, Kenova & Ceredo Water Co.; put in operation in '89. FRANCHISE.—60 yrs. from '89; provides for purchase of works by city after 30 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $2,910 per yr. No legal difficulties. SUPPLY.—Big Sandy River, pumping to reservoir and direct. PUMPS.—Cap., 1,500,000 galls.; Smith-Valle comp. dup. Bituminous pea and slack coal used; av. cost, 57 cts. per short ton in coal house. RESERVOIRS.—Cap., 3,000,000 galls. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by income. Taps, 525. Services, galv. i; paid for by consumer. Meters, 2; owned and controlled by Co. Use of meters compulsory for printing offices. Co. can compel use of meters and any consumer may have one. Hydrants, public, 81; private, 1. PRESSURE.—Ordinary, 145 lbs. FINANCIAL.—Cost, $70,000. Cap. Stock: Authorized, $100,000; all paid-up; paid 2% div'd in '95. Bonded debt, $50,000, at 6%, due in 20 yrs. Expenses: Operating, $2,900; int., $3,000. MANAGEMENT.—Prest., W. S. Edwards; Secy. and Supt., W. A. Patton; Treas., W. W. Seymour; Ch. Pump. Engr., Wm. Willis.

7. **CENTRAL CITY,** Muhlenberg Co. (1,144.) Built in '89 by Central City Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Green River, pumping to reservoir. PUMP.—Cap., 75,000 galls.; Dean. Av. cost of coal used, $1 per short ton. RESERVOIR.—Cap., 350,000 galls.; storage. DISTRIBUTION.—Mains, 4 miles. Taps, 150; made by Co. Services, iron and lead; paid for by Co. to curb. Meters, 1; owned and repaired by consumer. Use of meters optional with consumer. Hydrants, public, 15. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—(In '90, except operating expenses.) Cap.

Stock, $40,000. Bonded debt, $30,000, at 6%; $10,000, due in '99; $20,000 in 1909. No Sinking Fund. Expenses: Operating, $1,700; int., $1,800. Revenue, $3,450: Consumers, $2,700; City, fire protection, $750. MANAGEMENT.—Prest. and Secy., Barnum Coleman, Louisville. Rept. by Treas. and Supt., R. P. Day, July 11, '96. SEWERS.—None.

8. **CENTRAL COVINGTON** (P. O. Covington), Kenton Co. (981.) Supply from Covington. Apparently distribution system is owned by village and was constructed in '95, for press rept., May 17, '95, stated that village would lay mains and furnish meters under direction Covington works, and pay 14 cts. per 1,000 galls. for at least 10,000 galls. per day.

P 1. **CLINTON,** Hickman Co. (1,847.) R. W. Moore has franchise, but up to latter part '96 had not built works. Rept. by Cy. Clk., J. D. Taylor, Apr. 13, '96. Sanders & Porter, Louisville, rept. they had been engaged as Engrs. for water and light plant.

9. **COVINGTON,** Kenton Co. (37,371.) Built in '68-70 by city; rebuilt in '88-91. Water sold to works at Central Covington, Ludlow and Tatonia in bulk. SUPPLY.—Ohio River, pumping to reservoir. PUMPS.—Cap., 10,000,000 galls.; 2—5,000,000 Holly vert. high duty. Bituminous nut or slack coal used; av. cost, $1.12 per short ton. RESERVOIRS.—Cap., 110,000,000 galls. Three distributing, 35,000,000, 41,000,000 and 34,000,000. Three basins, at elevs. of 279 and 304 ft. above high water in river. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 43 miles; cost extensions met by water-works fund. Taps, 4,500; made by city at cost. Services, lead; paid for by property owner. Meters owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, not given. CONSUMPTION.—(Galls.) av., 2,624,320; max., 3,665,139; min., 1,583,502. PRESSURE.—Ordinary, 100 to 120 lbs. FINANCIAL.—Cost, $1,400,000. Bonded debt, $1,369,900, at 4%. Expenses, $81,016. Revenue: Consumers, unmetered, $26,587; metered, $38,251. MANAGEMENT.—Prest., D. B. Bayless; Secy., Al. Gerive; Treas., John O'Meara; Supt., W. H. Glore; Ch. Pump. Engr., Thos. Forster. Rept. by Supt, June 13, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 1, '82; new works, May 17, '90.

10. **CYNTHIANA,** Harrison Co. (3,016.) Built in '94 by city. Engr., Chas. C. Breed, Louisville. SUPPLY.—Pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon comp. non-cond. dup. STAND-PIPE.—Cap., about 300,000 galls.; steel, 22 × 110 ft. DISTRIBUTION.—Hydrants, 60. FINANCIAL.—Cost, $41,000. MANAGEMENT.—Rept. by Cy. Clk., L. S. Williams, Oct., '94, and from official advertisement for bids; hence subject to correction.

11. **DANVILLE,** Boyle Co. (3,766.) Built in '95 by city; put in operation July 1. Engr., Chester B. Davis, Chicago, Ill. Res. Engr., E. W. Smith, Stanford. Contrs., Howard De Long & Co. FRANCHISE.—Rates are fixed in franchise and subject to regulation by city. SUPPLY.—Impounding reservoir on Dix River, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Nordberg simple fly-wheel cond. Glen Mary bituminous coal used; av. cost, $2.60 per short ton. FILTER.—Cap., 500,000 galls.; New York. STAND-PIPE.—Cap., 225,000 galls.; steel; 16 × 150 ft. DISTRIBUTION.—Taps, 190; made by owner. Services, lead; paid for by property owner. Meters, 30; owned by consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 98. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $75,000. MANAGEMENT.—Supt., Johnson Allen; Ch. Pump. Engr., Anton Rehm. Rept. by Supt., June 20, '96. SEWERS.—None.

2. **DAYTON** (Station A, Newport P. O.) Campbell Co. (4,264.) See Bellevue.

12. **EARLINGTON,** Hopkins Co. (1,748.) Built by St. Bernard Coal Co. for its own use, but use of a few hydrants are given town. SUPPLY.—Pumping to reservoir 110 ft. above R. R. PUMPS.—Small Dean. Taps, 40. Meters, 40. Hydrants, public, a few. MANAGEMENT.—Rept. by Co., Jan., '97.

13. **ELIZABETHTOWN,** Hardin Co. (2,260.) Built in '95 by city; put in operation Jan. 21, '96; Engr., S. K. Felton, Cuthbert, Ga. Contrs., Hebert & Lapeyre, Chattanooga, Tenn. SUPPLY.—Large spring, dy. cap., 3,000,000 galls., pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Smith-Valle dup. Bituminous coal used; av. cost, $1.95 per short ton. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxation. Taps, 69; made by city for $3 for ½-in., $4.30 for ¾-in. and $5 for 1-in. Services, galv. i. or lead; paid for by consumer. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 20,000; max., 35,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 to 100. FINANCIAL.—Cost, $17,000. Bonded debt, $13,000, at 6%. Expenses: Operating, $1,500, est. Revenue: Consumers, unmetered, $625. MANAGEMENT.—Mayor and Supt., R. L. Wintersmith; Treas., Horace Hays; Ch. Pump. Engr., M. A. Phillips. Rept. by Mayor, Sept. 26, '96. SEWERS.—None.

14. **FALMOUTH,** Pendleton Co. (1,146.) Built in '96 by city; put in operation June 1. Engrs., Porter & Sanders, Louisville. Contr., J. R. Poindexter, Cynthiana. SUPPLY.—River, pumped to reservoir. PUMP.—Cap., 750,000 galls.; McGowan dup. high pressure. Kentucky bituminous coal used; av. cost, $3.30 per short ton. RESERVOIR.—Cap., 500,000 galls.; on hill 221 ft. above city. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by city. Taps, 60; made by city for $5. Services, lead and

iron; paid for by city to curb. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $14,500. Bonded debt, $12,500, at 6%; due in 1 to 13 yrs. MANAGEMENT.—Rept. by Supt. and Ch. Pump. Engr., R. B. McDonald, Aug. 7, '96. SEWERS.—None.

15. **FRANKFORT,** Franklin Co. (7,892.) First works built in '41 by town; present works built in '84-6 by Frankfort Water Co. FRANCHISE.—20 yrs. from '84; provides for purchase of works by city every 10 yrs. Co. is not exempt from local taxes. City to pay $7,000 at rate of $62.50 per hydrant for first 100 and $50 for each additional one; hydrants being 400 ft. apart. No legal difficulties. SUPPLY.—Kentucky River, pumping to reservoir. PUMPS.—Cap., 4,000,000 galls.; 2,000,000 vert. high duty Holly; 2,000,000 Barr. Pittsburg nut and slack coal used; av. cost, $1.60 per short ton. RESERVOIRS.—Cap., 8,000,000 galls.; 2—4,000,000. DISTRIBUTION.—Mains, 14 miles; cost extensions met by Co. Taps, 1,000; made by Co., free. Services, lead and galv. i.; paid for by Co. Meters 50; owned by Co. Use of meters compulsory for all consumers whose water rent would be $5.40 or more per month. Co. can compel use of meters and any consumer may have one. Hydrants, public, 112; private, 3. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $200,000. Cap. Stock: Authorized, $144,000; all paid-up. Bonded debt, $125,000, at 6%; due 1904. MANAGEMENT.—Prest., D. W. Lindsey; Secy., E. S. Ely; Treas., E. L. Samuels. Rept. by Supt., J. D. Griffin, June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 27, '82.

P 2. **FRANKLIN,** Simpson Co. (2,324.) Two elections in favor of works in '96 and city twice let contracts to Guild & White, Chattanooga. First election (apparently) illegal and second contract subject to court decision. Engr., J. A. Holmfoe, Louisville. Jan. 12, '97, makers rept. 2—500,000 Worthington non-com. non-cond. pumps as recently contracted for. Mayor, Jas. N. La Rue. Clk., S. N. Forline.

16. **FULTON,** Fulton Co. (1,818.) Built in '92 by city. Engr. and Contr., Geo. C. Morgan. SUPPLY.—Well, pumped to stand-pipe. PUMP.—Cap., 1,140,000 galls.; Deane dup. Bituminous coal used. STAND-PIPE.—Cap., 38,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles; cost extensions met by city. Taps, 375; made by city free. Services, iron; paid for by consumer. Meters: 6; owned, controlled and repairs paid by city; yearly rental, none. Use of meters compulsory for mills and R. R. Co. City cannot compel but may prohibit use of meters. Hydrants, public, 43, private, 3. PRESSURE.—Ordinary, 65 lbs. Steam fire engines used. FINANCIAL.—Floating debt, $25,000, at 6%. MANAGEMENT.—Prest., W. P. Felts; Secy., R. I. Nolan; Treas., A. J. Kirkland; Supt., A. C. Caldwell; Ch. Pump. Engr., Jno. Huddleston. Rept. by Supt., Aug. 10, '96. SEWERS.—None.

17. **GEORGETOWN,** Scott Co. (Est., 4,500.) Built in '89 by Georgetown Water Co.; now operated under name of Water Supply Co. of Georgetown in connection with an electric light plant. FRANCHISE.—Perpetual. Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Spring, pumping direct. PUMP.—Cap., 2,000,000 galls.; Laidlaw & Dunn. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 6.5 miles. Taps, 300. Hydrants, public, 66. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $50,000; paid-up, $5,000. No bonded debt. No separate account of expenses and revenue for waterworks. MANAGEMENT.—Prest., H. P. Montgomery; Secy. and Treas., E. B. Yates; Supt., T. H. Wolfe. Rept. by Prest., Sept. 26, '96.

18. **GLASGOW,** Barren Co. (2,051.) Built in '82 by Glasgow Water Co. FRANCHISE.—25 yrs. from '81. Does not provide for purchase of works nor regulation of rates by city. City to pay $250 per yr. No legal difficulties. SUPPLY.—Large spring, pumping to tank. PUMPS.—Cap., 200,000 galls.; Worthington simple high pressure. Wood used; av. cost, $1.50 per cord. TANK.—Cap., 94,500 galls.; Cypress; on hill. FISCAL YEAR CLOSED July 15. DISTRIBUTION.—Mains, 5 miles; cost extensions met by private funds. Taps, made by Co. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 6; private, 2. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $15,000; paid-up, $5,000. No debt. Expenses, Operating, $975. Revenue, $1,920. MANAGEMENT.—Prest. and Secy., T. P. Dickinson. Rept. by Secy., June 5, '96. SEWERS.—None.

19. **HARRODSBURG,** Mercer Co. (3,230.) Built in '92 by Harrodsburg Water Co.; put in operation June 15. Engr., A. I. Totten, Lexington. Contrs., Kentucky Water, Heating & Illuminating Co. FRANCHISE.—Perpetual from '92; provides for purchase of works by city after 5 years. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $4,300 for public service, at $50 each for 1st 70 hydrants and $40 for balance. No legal difficulties. SUPPLY.—Salt River, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane, a dup. and comp. dup. Bituminous coal used; av. cost, $2.10 per short ton, delivered. STAND-PIPE.—Cap., 286,000 galls.; steel; 22 × 100 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by revenue. Taps, 156; made by Co. for $15, average. Services, lead; paid for by consumer. Meters: 35; owned, controlled and repaired by Co. Use of meters not optional with consumer;

compulsory for mills, etc., and some private consumers. Hydrants, public, 92. CONSUMPTION.—(Galls.) av., 65,000; max., 75,000; min., 50,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $100,000; all paid-up. Floating debt, $2,000, at 7%; bonded, $60,000, at 6%; due 1912. MANAGEMENT.—Prest., George Clarke; Secy., J. M. Riche; Treas., J. F. Riche; Supt., P. West. Rept. by Secy., Aug. 4, '96. SEWERS.—Partial system of sanitary and storm sewers.

P 3. **HARTFORD,** Ohio Co. (740.) Ford & Taylor propose to build works in '97. Supply, stream, pumping to reservoir. Est. cost, $4,000. Rept. by W. H. Griffin, Oct., 31, '96.

20. **HENDERSON,** Henderson Co. (8,835.) Built in '74-76 by city. Supplies Audobon. SUPPLY.—Ohio River, pumping to reservoir and stand-pipe. PUMPS.—Cap., 5,000,000 galls.; 2,000,000 Laidlaw-Dunn-Gordon; 1,500,000 Gordon & Maxwell; 1,500,000 Gerald, Allen & Co. (Makers rept. 2,000,000 Laidlaw-Dunn-Gordon constructed in '94). Av. cost of coal used, 5⅝ cts. per bu. RESERVOIRS.—Cap., 3,000,000 galls.; 70 ft. above business part of city, 148 ft. above pump-well. STAND-PIPES.—New: Cap., 367,000 galls.; 25 × 100 ft., on brick foundation with stone capping. Old: Cap., 12,000 galls.; 5 × 80 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 19 miles; cost extensions met by income. Taps, 1,787; made by city at $7 for ½-in.; $8 for ¾-in.; and $10 for 1-in. Services, lead and galv. i.; paid for by owner. Meters: 19; owned, controlled and repaired by city. Use of meters compulsory for livery stables and manufacturers. City can compel use of meters and any consumer may have one by paying monthly rent. Hydrants, public, 90. CONSUMPTION.—(Galls.) av., 800,000; max., 1,200,000; min., 500,000. PRESSURE.—Ordinary, 40 lbs.; fire, 84 lbs. FINANCIAL.—Bonded debt, $115,000, at 6%. Expenses: Operating, $8,081; int., $6,900. Revenue: Consumers, unmetered, $9,209; metered, $2,471. No deficits. MANAGEMENT.—Prest., John Mundo; Secy. and Treas., R. C. Blackwell; Supt. and Ch. Pump. Engr., Jas. P. Wigal. Rept. by Secy., June, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 8, '82.

21. **HICKMAN,** Fulton Co. (1,652.) Built in '92 by city. SUPPLY.—By pumping. PUMPS.—570,000 galls.; Deane comp. dup.

22. **HOPKINSVILLE,** Christian Co. (5,833.) Built in '95-6 by Hopkinsville Water Co.; put in operation Feb. 10, '96. Engr., Jas. H. Wilkerson, Bowling Green. FRANCHISE.—20 yrs. from '96, with privilege of purchase of works by city at end of every 5 yrs. Rates are partially subject to regulation by city. Co. is exempt from local taxes for 5 yrs. City to pay $4,080 per yr. for 102 fire hydrants at $40 each. Contract with city for second year expires Feb. 10, '98. No legal difficulties. SUPPLY.—Little River, pumping to stand pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon. Av. cost of coal used, $1,62½ per short ton. STAND-PIPE.—Cap., 150,000 galls.; iron; 16 × 100 ft. Works had been operated only 11 mos. at time of rept. DISTRIBUTION.—Mains, 9½ miles; cost of extensions met by revenue and bonds if necessary. Taps, 204; made by Co., including service to curb, free. Services, galv. i.; paid for by consumer from curb. Meters, 10; owned, controlled and repairs paid by Co. Co. can compel use of metes and any consumer may have one. Hydrants, public, 102. CONSUMPTION.—(Galls.) av., 150,000; max., 200,000; min., 125,000. PRESSURE.—Ordinary, 85 lbs.; fire, 95 lbs. FINANCIAL.—Cost, $83,000, exclusive of franchise and contract. Cap. Stock, paid-up, $50,000. No floating debt. Bonded debt, $75,000. No deficits. MANAGEMENT.—Prest., H. D. Fitch; Secy., Edw. Smallhouse; Treas., C. G. Smallhouse; Supt., Jas. H. Wilkerson, all of Bowling Green; Ch. Pump. Engr., T. W. Morris. Rept. by Secy., Jan. 2, '97. PROJECTED IMPROVEMENTS.—Press rept., Feb., '97, stated Co. was to put in filter. SEWERS—None.

23. **KUTTAWA,** Lyon Co. (587.) Built in '95 by Kuttawa Water & Light Co.; put in operation May 1. Engr. and Contr., Sam. C. Molloy. FRANCHISE.—50 yrs. from '95; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Lake, pumping to reservoir. Lake has area of 40 acres, is 35 ft. deep, fed by five large springs. PUMPS.—Cap., 250,000 galls.; Laidlaw-Dunn-Gordon. Bituminous pea and slack coal used; av. cost, $1.00 per short ton delivered. RESERVOIR.—Cap., 200,000 galls. FISCAL YEAR CLOSED May, 96. DISTRIBUTION.—Taps, 132; made by Co. at cost. Services, lead; paid for by property owner. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 28,000; max., 33,000; min., 20,000. PRESSURE.—Ordinary and fire, 95 lbs. FINANCIAL.—Cost, $7,000. Cap. Stock: Authorized, $7,000; all paid-up. Floating debt, small. Bonded, none. Sinking Fund, $5,000, invested in real estate. Expenses: Operating, $750; taxes, $100. Revenue: Consumers, unmetered, $800; City, fire protection, $800; other purposes (factories and mills), $500. MANAGEMENT.—Prest., H. C. Cobb; Secy. and Treas., S. J. Snook; Supt., Sam. C. Molloy; Ch. Pump. Engr., W. E. Mathews. Rept. by Supt., Aug. 8, '96. SEWERS.—Partial system of sanitary and storm sewers.

P 4. **LAWRENCEBURG,** Anderson Co. (1,382.) Water and electric light plant under discussion in Jan., '97. Address W. H. McBrayer.

24. **LEBANON,** Marion Co. (2,816.) Built in '88-9 by city. SUPPLY.—Rolling Fork Creek, pumping either from filter gallery or direct from stream to reservoir. PUMP.—Cap., 1,000,000 galls.; Gordon comp. dup. cond. RESERVOIRS—Cap., 756,000 galls. Supply main, 12-in., 12,000 ft. long. DISTRIBUTION.—Mains, 9 miles. Taps, 145. Meters, 3.—Hydrants, 43. PRESSURE.—(In '89.) 120 lbs. FINANCIAL.—Cost, $55,649. Bonded debt, $58,550, at 6%; due in 1920. Sinking Fund: $1,500, invested at 6%. Expenses, $6,013: Operating, $2,500; int., $3,513. Revenue: Consumers, unmetered, $2,000. NOTE.—No rept. since '90-1 Manual.

25. **LEXINGTON,** Fayette Co. (21,567.) Present works built in '81 by Lexington Hydraulic & Mfg. Co.; first supplied in '82 by city. FRANCHISE.—60 yrs. from '82; provides for purchase of works by city at any time by arbitration. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental for 25 yrs. from Jan. 1, '85. No legal difficulties. SUPPLY.—surface water, pumping direct from impounding reservoir. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly-Gaskill hor. high duty. Bituminous coal used; av. cost, $2.80 per short ton. FILTERS.—Cap., 2,000,000 galls.; Jewell. RESERVOIR.—Cap., 360,000,000 galls.; area, 40 acres. FISCAL YEAR CLOSED Dec. 31,'95. DISTRIBUTION.—Mains, 18 miles; cost extensions met by revenue. Taps, 1,851; made by Co. Services, lead; paid for by consumer. Meters, 1,134; owned, controlled and repaired by Co. Use of meters compulsory for almost all consumers. Any consumer may have a meter. Hydrants, public, 263; private, 3. CONSUMPTION.—(Galls.) av., 1,200,000; max., 1,600,000; min., 800,000. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Receiver, S. A. Charles. REFERENCES.—Eng. News, Feb. 3, '83; meters, Mar. 29, '94; Jewell filters, May 28, '96; alum feeder for mechanical filters, Jan. 14, '97.

26. **LOUISVILLE,** Jefferson Co. (161,129.) Built in '57-60 by Louisville Water Co.; all the stock, except two $100 shares, is now owned by city sinking fund commissioners. Co. was formed to build works; city and private parties subscribed for stock, but sufficient capital not being secured city decided to build works under charter and finally bought stock. FRANCHISE.—Unlimited. Co. is exempt from city taxes, but receives no compensation for public service. SUPPLY.—Ohio River, pumping to reservoir, stand-pipe and direct. PUMPS.—Old station: Two Cornish, also Blake; combined cap., given in '89 Manual as 21,000,000 galls. New Station: 16,000,000-gall. Leavitt type beam and fly wheel high duty. Pittsburg lump coal used; av. cost, $2.40 per short ton. RESERVIOR.—Cap., 100,000,000 galls.; on Crescent Hill, 4½ miles from city hall. STANDPIPE.—Cap., 18,330 galls.; iron; 4 × 195 ft., with 4—20-in. overflow pipes surrounding the central pipe. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 195 miles; cost extensions met by Co. Taps, 18,223; made by Co., free. Services, lead; paid for by Co. to property line. Meters: 1,196; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants: public, fire, 159; sprinkling, 81. Fire cisterns, 645. CONSUMPTION.—(Galls.) av., 16,800,000; max., 22,600,000; min., 12,500,000. PRESSURE.—Ordinary, 45 lbs. Steam fire engines are used. FINANCIAL.—Cost, $5,383,450. Cap. Stock: Authorized, $1,275,100. Floating debt, $118,350; bonded, $1,400,000: $900,000 at 6%, due 1906; $500,000, at 5%, due 1910. Expenses: Operating, $70,771; int., $86,244; state taxes, $10,000. Revenue, $346,488. MANAGEMENT.—Prest., Chas. R. Long; Secy., J. B. Collins; Treas., W. F. Ingram. Rept. by Supt., Chas. Hermany, Sept. 28, '96. PROJECTED IMPROVEMENTS.—Extensive experiments were made in '95-6 with mechanical filters, with a view to establishing a plant. SEWERS.—Has sewers. REFERENCES.—Eng. News, May 7, '81; test of Leavitt pump, Dec. 13, '94, illus.

P 5. **MADISONVILLE,** Hopkins Co. (2,212.) City proposes to build works in '97. Supply, Pumping to stand-pipe. Chn. Special Com., M. W. Bishop. Repts. by Cy. Clk., C. Osburne, and Chas. B. Ross, Dec., '96.

27. **LUDLOW,** Kenton Co. (2,469.) Built in '93 by city; put in operation April, '93. Engr., J. J. Weaver. Contr., D. R. P. Dimmick, Newport. SUPPLY.—From Covington, through meter. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by water fund. Taps, 140; made by city for $7.65 to $9.80, according to width of street, including service. Services, lead; paid for by consumer. Meters: 140; owned by consumer; controlled and repaired by city at consumer's expense. Use of meters compulsory for all consumers. Hydrants, public, 36. PRESSURE.—Ordinary and fire, 119 lbs. FINANCIAL.—Cost, $26,900. Debt, $25,000, all bonded at 5%; due 1922. Expenses, $2,638: Operating, $1,380; int., $1,250. Revenue, $2,107: Consumers, $1,157; services, $959. Int. raised by tax of 10 cts. per $100 valuation. MANAGEMENT.—Mayor, R. H. Fleming; Secy., J. C. Richardson; Treas., J. S. McCormick. Rept. by Supt., G. T. Latta, Aug. 10, '96. SEWERS.—Partial system for storm water. NOTE.—All services are now put in by a system of hydraulic tunneling, thus avoiding open trenches.

28. **MAYFIELD,** Graves Co. (2,909.) Graves County Water & Light Co. let contract for works summer or fall of '91; to be completed Jan. 1, '92. Press rept., Jan. 27, '93, stated city had made contract with Co. and service would begin May 1. Dec., '96, citizen

rept. that works were in use. SUPPLY.—Wells, pumping to stand-pipe. MANAGEMENT.—Mgr., J. W. Landrum.

29. **MAYSVILLE,** Mason Co. (5,358.) Built in '80 by Maysville Water Co. FRANCHISE.—Rates were fixed by city in '80. Co was exempt from local taxes for five years; is not exempt now. City paid $65,000 for perpetual fire protection. No legal difficulties. SUPPLY.—Ohio River, pumping to reservoir. PUMPS.—Cap., 3,500,000 galls.; Blake high pressure differential bucket and plunger. (Makers rept. 1,250,000 Laidlaw-Dunn-Gordon.) Kanawha bituminous nut and slack coal used; av. cost, $1.20 per short ton delivered. RESERVOIRS.—Cap., 3,000,000 galls.; 2—1,500,000; 418 ft. above pumps, 425 ft. above low water in river; storage. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 14 miles; cost extensions met by Co. Taps, 850; made by Co. for $5, including service to curb. Services, lead and iron; paid for by consumer. Meters: 50; owned by Co. and consumer; controlled and repaired by Co; yearly rental, $4. Use of meters compulsory for distillers, cotton mills, stables and ice factory. Co. cannot compel but may prohibit use of meters. Hydrants, public, 75; private, 3.—CONSUMPTION.—(Galls.) av., 575,000; max., 650,000; min., 500,000. PRESSURE.—Ordinary, 150 lbs. FINANCIAL.—First cost, $150,000. Debt, $90,000: Floating, $15,000, at 6%; bonded, $75,000. Expenses: Int., $4,500; taxes, $850. MANAGEMENT.—Prest., C. D. Pearce; Secy., A. R. Cooper, Louisville; Treas., David Dye. Rept. by Supt., A. Schaaffer, July 14, '96. SEWERS.—None. REFERENCE.—Eng. News, May 3, '84.

30. **MIDDLESBORO,** Bell Co. (3,271.) Present works built in '90-1 by Middlesboro Water-Works Co., Ltd., London, England. Temporary supply introduced in '89 by C. W. Loverin. Press repts. state plant was bid in for Co. at court sale in '94. FRANCHISE.—30 yrs. from '90. SUPPLY.—Little Yellow Creek and mountain streams, pumping from impounding reservoir to stand-pipe. PUMPS.—Cap., 6,000,000 galls.: 2—3,000,000 Allis hor. tandem comp. Bituminous coal used; av. cost, $1.05 per short ton. RESERVOIR.—Cap., 637,500,000 galls.; impounding formed by dam 665 ft. long. TANK.—Cap., 1,220,686 galls., iron; 75 × 37 ft. FISCAL YEAR CLOSED in June. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by Co. Taps, 165; made by Co. Services, galv. i.; paid for by consumer. Meters: 139; owned, controlled and repaired by Co.; yearly rental, 12½%. Use of meters optional with Co. Hydrants, public, 35; private, 2. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 115 lbs. One steam fire engine is owned by city. MANAGEMENT.—Prest., J. M. Brook; Secy. and Supt., A. H. Martine; Ch. Pump. Engr., J. Hart. Rept. by Supt., June 9, '96. SEWERS.—Has partial system of sanitary sewers.

43. **MILLDALE,** Kenton Co. (1,003.) Now called Tatonia, which see.

31. **MORGANFIELD,** Union Co. (1,094.) Built in '95 by city; put in operation Dec. 1. Engr., A. B. Sanders, Louisville. Contrs., Guild & White, Chattanooga, Tenn. SUPPLY.—Well, 290 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane dup. Bituminous slack coal used; average cost, 8½ cents per bu. RESERVOIR.—Cap., 250,000 galls.; storage. TANK.—Cap., 60,000 galls.; iron; 16 × 40 ft. on brick tower. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 5 miles. Taps, 103; made by city for $2. Services, lead and galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 30. CONSUMPTION.—(Galls.) 7,000 to 10,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, about, $21,000. Bonded debt, $20,000 at 6%. Expenses, Operating, about $850. Revenue, Consumers, $1,200 (for 18 mos.). MANAGEMENT.—Secy. and Treas., A. F. Waller; Supt. and Ch. Pump. Engr., Saml. Boehm. SEWERS.—Sanitary sewers ("not good").

D 1. **MUNFORDVILLE,** Hart Co. (475.) Domestic works built in '95. Supply, spring, pumping to small tank. Cost, $2,200. Rept. by citizen, Dec. 2, '96.

32. **NEWPORT,** Campbell Co. (24,918.) Built in '72 by city. SUPPLY.—Ohio River, four miles above city, pumping to storage reservoir. Force main (in '89): 20-in. c. i. for 1,445 ft., rising 350 ft.; 24-in. for 250 ft. from crest of bluff, then 20-in. for 4,318 ft., falling 56 ft. PUMPS.—Cap., 8,000,000 galls.; 2—4,000,000 Holly vert. rotative. Kentucky bituminous nut and slack coal used; av. cost, $1 per short ton. RESERVOIR.—Cap., 65,000,000 galls.; storage. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 35 miles; cost extensions met by water comrs. Taps, 4,600; made by city for $2.50. Services, lead; paid for by consumer. Meters, 200; owned by consumer; controlled by city. Use of meters optional with consumer; compulsory for manufacturers and some dwellings. Hydrants, public, 188; private, 10. CONSUMPTION.—(Galls.) av., 2,250,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, $1,200,000. Bonded debt, $750,000, at 7.3%. Expenses, $70,500: Operating, $17,500; int., $52,000; taxes, $1,000. Receipts over and above expenses, amounting to about $30,000, are applied to paying interest on bonds. MANAGEMENT.—Prest., John Mooders; Secy., Jas. M. Betz; Treas., Peter Weekman; Supt., John Surran; Ch. Pump. Engr., Hugh McChane. Rept. by Supt. PROJECTED IMPROVEMENTS.—New 5,000,000-gall. pump. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 30, '81.

33. **NICHOLASVILLE,** Jessamine Co. (2,157.) Built by Kentucky Water, Heating & Illuminating Co.; now owned by Nicholasville Water Co.; put in operation Feb., '93 Contrs., J. A. Gearry & Co. CONTRACT.—20 yrs. from 1892. Co. is not exempt from

local taxes. City to pay $50 per hydrant per yr. LEGAL DIFFICULTIES.—Co. sued city to recover payment for water service, which the latter refused to pay because of nonfulfilment of contract in matter of quality. Court decided contract void because not voted on by people. PUMPS.—Cap., 1,750,000 galls.; two Deane dup., one being comp. Kentucky bituminous coal used; av. cost, $1.60 per short ton. RESERVOIR.—Cap., 12,000,000 galls.; 3 miles from city; made by damming creek; in '94 it ran dry. TANK.—Cap., 150,000 galls.; 80 ft. high on highest ground in city. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Services paid for by consumer. Meters: 40; owned and repaired by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50. CONSUMPTION—(Galls.) av., 50,000. FINANCIAL.—Cost, $42,000. MANAGEMENT.—Prest., J. A. Geary. Secy., J. T. Roach, both of Lexington.

34. **OWENSBORO,** Daviess Co. (9,837.) Built in '79 by Owensboro Water-Works Co. SUPPLY.—Ohio River, pumping direct. PUMPS.—Three Gaskill, with combined cap. of 5,000,000 galls. rept. some years ago. Rept. in '89, that contracts had been let for 5,000,000 Buffalo. (Makers rept. 3,500,000 Deane. comp. cond. dup. added in '90; also makers rept. but one Holly, and that 2,000,000 vert. dup.) DISTRIBUTION.—Mains, 17 miles. Taps, 800. Meters, 33. Hydrants, 126. FINANCIAL.—Withheld. MANAGEMENT.—Prest., A. F. Callahan; Secy., Wm. Sackett; V.-Prest. and Ch. Engr., J. W. Holmes; Treas., D. Long Miller, all of Louisville. Supt., H. P. Martin. Rept by Supt., Sept. 25, '96. SEWERS.—Has sewers. NOTE.—No rept., except as to management, since '90-1 Manual. REFERENCE.—Eng. News, June 17, '82.

35. **PADUCAH,** McCracken Co. (12,797.) Now owned by Paducah Water Co.; built in '86 by Paducah Water Supply Co. FRANCHISE.—40 yrs. from '84. Rates are required to be the average of Louisville, St. Louis, Cincinnati, Kansas City and Nashville. Co. is not exempt from local taxes. City to pay $40 each for first 150 hydrants; $30 for next 30 and $25 each for all above that number; contract to run 20 yrs. No legal difficulties. SUPPLY.—Ohio River, pumping direct or to stand-pipe. Falcon rotary strainers at intake. PUMPS.—Cap., 4,000,000 galls. 2—2,000,000 Holly vert., one rotative, one high duty. Av. cost of coal used, $1.50 per short ton. STAND-PIPE.—Cap., 497,700 galls.; 22 × 175 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 22 miles. Taps, 1,800; made by consumer. Services, lead; paid for by property owner. Meters: 20; owned by Co. and consumers in part; controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 188. CONSUMPTION.—(Galls.) av., 1,200,000. PRESSURE.—Ordinary, 55 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Authorised, $300,000; paid-up, $150,000; paid 5% div'd in '95. Floating debt, $13,000, at 6%; bonded, $150,000, at 6%; due 1924. Expenses, $22,550: Operating, $8,000; int., $10,000; taxes, $4,550. Revenue, City, fire protection, $7,050. MANAGEMENT.—Prest., Henry Burnett; Secy., S. M. Rieke; Treas. and Supt., Muscoe Burnett; Ch. Pump. Engr., F. H. Holly. Rept. by Supt., June 9, '96. SEWERS.—Projected.

36. **PARIS,** Bourbon Co. (4,218.) Built in '90-1 by Paris Water Co. FRANCHISE—Perpetual. City to pay $2,500 for 80 hydrants, $30 each for additional ('90 rept.). SUPPLY.—Stoner Creek, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Deane dup.; one being comp. STAND-PIPE.—Cap., 293,000 galls.; iron; 25x80 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8.6 miles. Taps, 355; made by Co. Services, galv. i.; paid for by Co. to street line. Meters: 10; owned and controlled by Co.; repairs paid by one at fault; yearly rental, none. Use of meters optional with Co.; compulsory for manufacturers and mechanical users. Hydrants, public, 97. CONSUMPTION.—(Galls.) av., 130,879; max., 216,400; min., 82,500. PRESSURE.—Ordinary, 50 to 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $182,766. Cap. Stock: Paid-up, $100,000. Bonded debt, $87,000, at 6%. Sinking Fund, invested in bonds of Co. MANAGEMENT.—Prest., J. M. Thomas; Secy., J. F. J. Mulhall; Treas., Chas. F. Parks, both of Boston; Supt., Newton Mitchell. Rept. by Wm. Wheeler, Supervising Engr., Boston, Oct. 5, '96. SEWERS.—None.

37. **PINEVILLE,** Bell Co. (Est., 1,200.) Built in '88 by Pineville Water Co. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Mountain streams, by gravity, and Cumberland River, by pumping. Gravity source, 400 ft. above, 3 miles from, town. RESERVOIR.—Cap., about 150,000 galls. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 6 miles. Taps, 200. Meters, 0. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 100,000. FINANCIAL.—Cost, $36,000. Cap. Stock: Authorised, $50,000; paid-up, $24,800. Debt, $29,500: Floating, $17,000; bonded, $12,500, at 6%; due in 1904. Expenses, $2,850: Operating, $1,000; int., $1,750; taxes, $100. Revenue, $3,195: Consumers, $2,500; City, fire protection, $195; other purposes, $500. MANAGEMENT.—Prest. and Treas., F. A. Hull, Danbury, Conn.; Secy., W. W. Duffield; Supt., S. Evans. Rept. by Prest., Sept. 28, '96.

38. **PLEASANT HILL,** Mercer Co. (Est., 200.) Now owned by the Shaker Community of Pleasant Hill. Built in '33 by Co. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Large flowing spring, pumping to tank. PUMP.—Twin pump. TANK.—Cap., 12,000 galls.; 10 ft. high. DISTRIBUTION.—Taps, made by village, free. Services, lead; paid for by consumer at cost. Meters, 0. Hydrants, public, 3. CONSUMPTION.—(Galls.) av., 1,000. FINANCIAL.—Cost, $2,000. MANAGEMENT.—Prest.,

J. W. Shelton; Secy., W. F. Pennebaker; Supt., A. Kulp; Ch. Pump. Engr., H. Power. Rept. by F. M. Pennebaker, Postmaster, June 12, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Oct. 1, '81.

89. **RICHMOND.** Madison Co. (4,753.) Built in '90-1 by Richmond Water & Light Co.; put in operation June 16, '91. FRANCHISE.—20 yrs. from '91; provides for purchase of works by city at end of 10, 15 and 20 yrs. Rates are fixed in original contract. Co. is exempt from local taxes for 5 yrs. No legal difficulties. SUPPLY.—Springs and creek, by pumping from impounding reservoir to tank. PUMPS—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. Bituminous nut coal used; av. cost, $1.75 per short ton. RESERVOIR.—Cap., 72,000,000 galls.; impounding. TANK.—Cap., 150,000 galls.; on brick tower 100 ft. high. DISTRIBUTION.—Mains, 12 miles; cost extensions met by Co. Taps, 275; made by Co., free. Services, galv. i.; paid for by consumer. Meters: 8; owned and repaired by consumer; controlled by Co. Use of meters compulsory for large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 77; private, 1. CONSUMPTION.—(Galls.) av., 200,000; max., 300,000; min., 75,000. PRESSURE.—Ordinary, 60 lbs.; fire, 75 to 100 lbs. FINANCIAL.—Cost, $235,000, including gas works. Cap. Stock: Common, authorized, $200,000; all paid-up; paid no div'd in '95. Floating debt, $12,500; bonded, $185,000, at 6%; due 1910. Expenses: Operating, $3,500, for water-works only; int., $11,100; taxes, $500. Revenue: City, fire protection,$3,850; other purposes, $9,000. MANAGEMENT.—Prest., Chas. S. Powell; Secy. and Treas., J. A. Sullivan; Supt., D. J. Dougherty; Ch. Pump. Engr., C. M. Misner. Rept. by Co., June 5, '96. SEWERS.—Has storm sewers only.

40. **SHELBYVILLE.** Shelby Co. (2,679.) Built by Shelbyville Water & Light Co.; put in operation Jan. 1, '95. Engr., George C. Morgan, Chicago. FRANCHISE.—13½ yrs. from '95. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $2,200; right of city to contract to pay this amount confirmed by State Court of Appeals at instance of Co. before beginning construction. No legal difficulties. SUPPLY.—Clear Creek, pumping to tank. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 McGowan dup.; a comp. and a high pressure. Middlesboro, Morton & Pineville bituminous coals used; av. cost, $2.40 per short ton. FILTERS.—Cap., 100,000 galls.; "Sellers, designed by G. C. Morgan." RESERVOIRS.—Cap., 80,000 galls.; storage. TANK.—Cap., 50,000 galls.; steel; 12 × 60 ft., on brick tower 56 ft. high. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by consumers. Taps, 131; made by consumer for $5. Services, galv. i.; paid for by consumer. Meters: 5; owned, controlled and repaired by Co. Use of meters compulsory for consumers with whom special rates are made. Co. can compel use of meters and any consumer may have one. Hydrants, public, 54; private, 2. CONSUMPTION.—(Galls.) av., 40,000; max., 150,000; min., 12,500. PRESSURE.—Ordinary, 60 to 80 lbs.; fire, 60 to 140 lbs. Steam fire engine is owned by town but not used. FINANCIAL.—Cost, $51,000. Cap. Stock: Authorized, $20,000; all paid-up; paid no div'd in '95. Debt, $30,000, at 6%. This indebtedness includes the electric light plant, which is operated in same building and by same officers. Expenses: Operating, $1,000; int., $1,600. Revenue: Consumers, metered, $70; City, fire protection, and other purposes, $2,250. MANAGEMENT.—Prest., L. Chowing; Secy., M. F. Rothchild; Treas., H. P. Poynter; Supt., James Stewart; Ch. Pump. Engr., H. T. Durall. Rept. by Supt., June 24, '96. PROJECTED IMPROVEMENTS.—Change in mode of filtering. SEWERS.—None.

41. **SOMERSET,** Pulaski Co. (2,625.) Built in '90-1 by Somerset Water Co.; put in operation Jan. 1, '91. FRANCHISE.—20 yrs. from '90; provides for purchase of works by city every 5 yrs. Rates are fixed in contract. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. No legal difficulties. SUPPLY.—Pittman Creek, pumping to reservoir. PUMPS.—Cap., 1,400,000 galls.; Laidlaw-Dunn-Gordon: 900,000 comp., and 500,000 high pressure. Av. cost of coal used, $2.10 per short ton. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by earnings. Taps, 270; made by Co. for $14.50, including service to curb, street box and cock. Services, lead or galv. i.; paid for by owner. Meters: 22; owner, controlled and repaired by Co.; yearly rental, none. Use of meters optional with consumer. Hydrants, public, 59. CONSUMPTION.—(Galls.), av., 250,000; max., 300,000; min., 200,000. Ry. uses 90,000 to 125,000 galls. daily of this amount. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $36,000. Cap. stock: Authorized $100,000; paid no div'd in '95. Bonded debt, $45,000, at 6%. Expenses, $6,430: Operating, $3,150; int., $2,700; taxes, $580. Revenue, $6,600: Consumers, unmetered, $1,900; metered, $1,750; City, fire protection $2,950. MANAGEMENT.—Prest., John A. Geary; Secy., James Denton; Treas., C. H. Raddle; Ch. Pump. Engr., Thos. Haines. Rept by Prest. July 10, '96. SEWERS.—None.

42. **STANFORD,** Lincoln Co. (1,385.) Built in '92 by Stanford Water, Light & Ice Co.; put in operation Sept., '92. Des. Engrs., B. J. C. Home and E. W. Smith. Const. Engr., E. W. Smith, Danville. Contrs., Howe Pump & Engine Co., Indianapolis. FRANCHISE.—20 yrs. from '92. Rates are subject to regulation by city within certain limits. Co. is exempt from local taxes for five years. City to pay $3,180 for water and lights. SUPPLY.—Springs, by pumping. Well was sunk in gravel at or near spring.

PUMP.—Cap., 1,140,000 galls.; Deane comp. dup. Pea and nut coal used; av. cost, $1.35 per short ton. RESERVOIRS.—Cap., 6,200,000 galls.; impounding and storage. FISCAL YEAR CLOSED Jan 1. DISTRIBUTION.—Mains; cost extensions met by revenue. Taps, made by consumer for $1. Services galv. i.; paid for by owner of premises. Co. can compel use of meters and any consumer can have one. Hydrants, public, 42. CONSUMPTION.—(Galls.), av., 125,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $58,284. Cap. stock: Authorized, $56,000; all paid-up; paid 6% div'd in '95. No debt. Expenses: Operating, $9,665; taxes, $179. MANAGEMENT.—Prest., W. G. Welch; Secy. and Treas., G. L. Penny; Supt., J. W. Hayden. Rept. by Secy., June 23, '96. SEWERS.—Has storm sewers.

43. **TATONIA,** formerly Milldale, Kenton Co. (1,003.) Built about '93 by Kenton Water Co. SUPPLY.—Covington Works. MANAGEMENT.—Rept. by Secy. and Treas., G. W. Howell, June 13, '96.

P 6. **UNIONTOWN,** Union Co. (1,087.) "Election to find sense of the people" was to be held Dec. 19, '96. Supply, Ohio River, pumping to stand-pipe. Est. cost, $20,000. Rept. by Cy. Clk., H. E. Berry, Nov. 4, '96.

44. **WINCHESTER,** Clark Co. (4,519.) Built in '90-1 by Winchester Water Co.; put in operation July 1. FRANCHISE.—Perpetual. SUPPLY.—Lower Howard's Creek, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane dup., one being comp. FILTERS.—Cap., 375,000 galls.; Jewell pressure. RESERVOIR.—Cap., 53,200,000 galls.; storage; formed by dam on creek; area, 21.35 acres. STAND-PIPE.—Cap., 275,400 galls; iron; 25 × 75 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles. Taps, 140; made by Co. for $3. Services, galv. i.; paid for by Co. to street line. Meters: 8; owned and controlled by Co.; repairs paid by one at fault; yearly rental, none. Use of meters, optional with Co.; compulsory for manufacturers and mechanical establishments. Hydrants, public, 79. CONSUMPTION.—(Galls.) av., 107,426; max., 149,820; min., 71,376. PRESSURE.—Ordinary, 84 to 78 lbs. Steam fire engines are used. FINANCIAL.—Cost, $193,594. Cap. stock, paid-up, $100,000. Bonded debt, $92,000, at 6%. Sinking Fund, invested in bonds of Co. MANAGEMENT.—Prest., Lucius H. Fuller, Putnam, Conn.; Secy. and Treas., J. F. J. Mulhall, 89 State St., Boston; Supt., E. L. King. Rept. by Wm. Wheeler, Supervising Engr., Boston, Oct. 5, '96. SEWERS.—None. REFERENCES.—Jewell filters, Eng. News, May 28, '96.

GROUP V.—CENTRAL NORTHERN STATES.

Water-Works Completed, in Process of Construction, or Projected, in Ohio, Indiana, Michigan, Illinois and Wisconsin.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

OHIO.

1, D 1. **AKRON,** Summit Co. (27,601.)

AKRON WATER-WORKS CO.

Built in '80-1, under perpetual charter. FRANCHISE.—24 yrs. from '93; provides for purchase of works by city. Rates to be governed by those of Cleveland. No legal difficulties. SUPPLY.—Wells and lake, pumping to reservoir. First well was 50 × 32 ft. PUMPS.—Cap., 4,500,000 galls.; Worthington comp.: 1,500,000 cond., and 3,000,000 hor. high duty. Air lift pump installed in '94, with 10 × 14-in. Rand air compressor (rept. by maker). Bituminous slack and lump coal used; av. cost, $1.35 to $1.40 per short ton. RESERVOIR.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 45 miles. Taps, 3,195; made by Co. for $3. Services, galv. i.; paid for by property owner. Meters, 150; owned by Co. Use of meters optional with Co. Hydrants, public, 286. CONSUMPTION.—(Galls.) av., 3,000,000; max., 4,000,000; min., 2,500,000. Steam fire engines are used. FINANCIAL.—(In '90.) Bonded debt, $200,000, at 6%; due 1900. Revenue: City, $9,560. MANAGEMENT.—Prest., Geo. W. Crouse; Secy., W. G. Smith; Treas., I. H. Berry, both of Detroit, Mich; Supt., E. A. Lawton; Ch. Pump. Engr., Frank Pease. Rept. by Asst. Treas., July 9, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Dec. 10, '81.

AKRON COLD SPRING CO.

Supplies a few families on west side of city and does not compete with other Co. Supply, springs. Rept. by Akron W.-W. Co., Dec. 11, '96. Press rept., Feb., '92, stated Co. had authorized cap. stock of $10,000, of which $7,500 had been issued.

2. **ALLIANCE,** Stark Co. (7,607.) Built in '83 by Alliance Water-Works Co.; reconstructed in '92. Consult. Engr., Chas. B. Brush; Actg. Ch. Engr., Louis L. Tribus. SUPPLY.—Mahoning River, pumping to stand-pipe and direct. (See note.) PUMPS.—Cap., 4,500,000 galls.; Worthington: 1,000,000; 1,500,000 comp. non-cond.; 2,000,000 comp. cond. (rept. by makers). FILTERS.—Gravel. RESERVOIRS.—Cap., 5,500,000 galls.; settling basin, 4,000,000; pumping basin, 1,500,000. STAND-PIPE.—Cap., 225,000 galls.; 20 × 100 ft., on Mt. Union. DISTRIBUTION.—Mains, 14 miles. Hydrants, public, 127; private, 2. PRESSURE.—Ordinary, 112 lbs. FINANCIAL.—(In '90.) Cost, $155,615. Cap. Stock: Authorized, $75,000; all paid-up. Bonded debt, $70,000, at 6%. NOTE.—Improvements made in '92 (see above) included new intake chamber, changes in settling basins, new pumping station, moving stand-pipe to higher elev., and 7 miles new mains. Rept. on improvements by Engr. No rept. from local officials since '90-1 Manual. REFERENCES.—Eng. News, June 9, '83; reconstruction, stand-pipe removal and intake, June 14, '94, illus.

3. **ARLINGTON HEIGHTS,** Hamilton Co. (222.) Built in '95 by the hamlet; put in operation April 15. Engr., H. C. Innes, Hartwell, O. Contrs., H. D. Crane & Co. SUPPLY.—From Reading via Lockland, through 4-in. meters. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by issue of bonds. Taps, 20; made by consumer. Services,

lead; paid for by consumer. Meters, 1; owned, controlled and repaired by consumer. Use of meters optional with consumer. Hydrants, public, 15. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Bonded debt, $6,000, at 6%. Have a sinking fund. MANAGEMENT.—Rept. by W. M. Lacey, Water Clerk, Sept. 20, '96. SEWERS.—None.

4. **ASHLAND,** Ashland Co. (3,566.) Built in '95 by city; put in operation Sept. 1. Engr., J. B. Strawn, Salem. Contrs., Snyder & Williams, Dayton. SUPPLY.—Dug well, pumping to stand-pipe and direct. Well, 30 ft. diam., fed by springs; overflows when pumps are not in service. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Stilwell-Bierce Co. Bituminous coal used; av. cost, $1.65 per short ton. STAND-PIPE.—Cap., 176,250 galls.; steel; 20 × 75 ft. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 13 miles. Taps, 125; made by city for $5. Services, galv. i.; paid for by city to curb. Meters, 3; owned by city; yearly rental, none. Use of meters optional with city; compulsory for large consumers. Meters are used simply to determine amount of water used, and that being done they are taken out and rental fixed in conformity with regular list. Hydrants, public, 110; private, 2. CONSUMPTION.—(Galls.) av., 50,000; max., 100,000; min., 25,000. PRESSURE.—Ordinary, 75 lbs.; fire, direct pressure. FINANCIAL.—Cost, $50,000. Bonded debt, $45,000, at 6%; due at intervals until 1918. Sinking Fund, none. Expenses: Operating, $1,075 first 6 mos. Revenue: Consumers, unmetered, $880 (1st ½ yr.) Deficits are all met by taxation. MANAGEMENT.—Prest., Edward S. Briggs; Secy., Nathan Strauss; Treas., R. W. Cowan; Supt., J. S. Hunter; Ch. Pump. Engr., Ben Drill. Rept. by Secy., July 19, '96. SEWERS.—None.

5. **ASHTABULA,** Ashtabula Co. (8,338.) Built in '87 by Ashtabula Water Supply Co. In hands of receiver. FRANCHISE.—20 yrs. SUPPLY.—Wells and tubes on sandy shore of Lake Erie, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.: 2—1,500,000 Worthington comp. cond. RESERVOIR.—Cap., 3,000,000 galls. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft. DISTRIBUTION.—Mains, 15 miles. Taps, 916. Meters, 20. Hydrants, 100. FINANCIAL.—Cost, $320,000. Cap. Stock: Paid-up, $250,000. Bonded debt, $250,000 at 6%. Expenses, $22,920: Operating and taxes, $7,920; int., $15,000. Revenue, $25,060: Consumers, $18,000; R. R. $2,560; City, $4,500. NOTE.—Above information from '90-1 Manual. Request for information returned unfilled and unsigned and marked "in hands of a receiver, no report except what is filed in U. S. Court in Cleveland."

6. **ATHENS,** Athens Co. (2,620.) Built in '94 by city; put in operation May 1. Engrs. and Contrs., Stephens & Bedwards. SUPPLY.—Well, pumping to stand-pipe. PUMP.—Cap., 750,000 (makers rept. 1,500,000) galls.; Laidlaw-Dunn-Gordon. Run of mine bituminous coal used; av. cost, $1.40 per short ton. STAND-PIPE.—Cap., 90,000 galls.; steel; 16 × 60 ft. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by earnings. Taps, 400; made by city for $3. Services, galv. i.; paid for by city to curb. City can compel use of meters and any consumer may have one. Hydrants, public, 62; private, 4. CONSUMPTION.—(Galls.) av., 187,500; max., 280,000; min., 145,000. PRESSURE.—Ordinary 65 to 90 lbs.; fire, 120 lbs. FINANCIAL.—Expenses: Operating, $1,500. Revenue: Consumers, $2,500; other purposes, $195. MANAGEMENT.—Prest., H. O. Blenness; Ch. Pump. Engr., J. McKee. Rept. by Secy. and Supt., W. Scott, Dec. 12, '96. SEWERS.—Has sanitary sewers only.

7. **ATTICA,** Seneca Co. (682.) Built in '95 by village; put in operation in July. Engr., E. C. Cooke, Cleveland. SUPPLY.—Ground water, pumping to tank. Well, 28 × 25 ft., from which 300 ft. of 8-in. tile is laid in vein of quicksand. PUMP.—Cap., 500,000 galls.; Hicks gas engine, operating Laidlaw-Dunn-Gordon pump. TANK.—Cap., 58,750 galls.; steel, conical base; 20 × 25 ft.; on brick tower 40 ft. high. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by issue of bonds; to be paid by taxes. Taps., 52; made by village, free, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters: 24; owned by consumer; yearly rental, $2. Use of meters compulsory for all except dwellings and sprinkling. Hydrants, public, 27. Village can compel use of meters and any consumer may have one. PRESSURE.—Ordinary, 35 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $14,717. Bonded debt, $15,000, at 6%; due 1 to 20 yrs. MANAGEMENT.—Prest., J. W. Hathaway; Secy., L. L. Sutton; Supt., D. Y. Fink. Rept. by Secy., June 15, '96. SEWERS.—None.

27. **AVONDALE,** Hamilton Co. Now part of Cincinnati, which see.

F 1. **BARBERTON,** Summit Co. (Not given.) Press rept., May, '95, stated village owned 4 miles mains, to which water was supplied for fire protection from pumps in factories.

8. **BELLAIRE,** Belmont Co. (9,934.) Built in '72 by city. SUPPLY.—Ohio River, pumping to reservoir. PUMPS.—Cap., 5,000,000 galls.; one Lowry and one Epping, Carpenter & Co. RESERVOIRS.—Cap., 3,000,000 galls.; one mile from and 165 ft. above main part of city. DISTRIBUTION.—Taps, 1,340. Services, lead. Hydrants, public, 97. PRESSURE.—(In '89.) 85 lbs. FINANCIAL.—Cost, $175,000. Bonded debt, $120,000. Expenses: int., $7,200. Revenue, $17,000. MANAGEMENT.—Prest., W. S. Carroll. Rept. by Secy. and Supt., W. J. Kirkpatrick, Nov. 2, '96. REFERENCE.—Eng. News Oct. 1, '81.

9. **BELLEFONTAINE,** Logan Co. (4,245.) Built in '88 by town. SUPPLY.—Two artesian wells, pumping to reservoir. Wells, 8-in., 140 ft. deep. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon comp. direct-acting. Mine run bituminous coal used; av. cost,

$2.10 per short ton. RESERVOIR.—Cap., 2,000,000 galls.; 154 ft. above city mains. DISTRIBUTION.—Mains, 12½ miles; cost extensions met by revenue. Taps, 650; made by city, free. Services, lead; paid for by city to curb. Meters, 14; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 109. CONSUMPTION.—(Galls.) av., 750,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $128,000. Expenses: Operating, $5,000. MANAGEMENT.—Prest., Dr. A. E. Griffin; Secy., E. J. Short; Supt., C. F. Martin; Ch. Pump. Engr., Milan Ayres. Rept. by Supt., June 15, '96.

10. **BELLEVUE,** Huron and Sandusky Cos. (3,052.) Built in '78 by city. SUPPLY.—Surface water, collected in reservoir by ditch, pumping to stand-pipe. PUMPS.—Two Knowles, also 1,500,000-gall. Gordon. RESERVOIR.—Cap., 100,000,000 galls.; area 12 acres. STAND-PIPES.—Old: No data. (New: Cap., 235,000 galls.; 20x100 ft. Bids for such a pipe were invited in '93 and bonds were rept. sold about same time. No further data.) DISTRIBUTION.—Mains, 10 miles. Taps, 390. Meters, 0. Hydrants, 33. FINANCIAL.—Cost, $40,000. Bonded debt, $22,000, at 5%. (Press rept. in '94 stated $12,000 bonds had been sold.) Expenses, $2,717: Operating, $1,617; int., $1,100. Revenue, Consumers, $2,440. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Oct. 27, '83.

11. **BLANCHESTER,** Clinton Co. (1,196.) Under construction in '96 by city; contracts let in Oct. Engr., G. L. McKibben, Van Wert. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 McGowan comp. dup. (rept. by makers). MANAGEMENT.—Village Clk., Owen Brown. Information from Engr., Councilman John Frasee and official advertisement.

12. **BLUFFTON,** Allen Co. (1,290.) Built in '96 by city; put in operation Sept. 10. Engrs., Sanders & Porter, Louisville, Ky. Contrs., H. D. Shannon & Co., Orrville. SUPPLY.—Drilled wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Stillwell-Bierce & Smith-Vaile. TANK.—Cap., 85,000 galls.; 28 ft. high, on tower 84 ft. high. DISTRIBUTION.—Mains, 3½ miles. Hydrants, public, 38. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $18,000. MANAGEMENT.—Ch. Pump. Engr., J. Grimes. SEWERS.—None.

13. **BOND HILL,** Hamilton Co. (899.) Built in '95 by village. SUPPLY.—From Saint Bernard works. DISTRIBUTION.—Mains, 4½ miles. Services, paid for by consumer. Meters, 27; owned, controlled and repaired by village; yearly rental, $1.20. Use of meters compulsory for all consumers. Hydrants, public, 40. CONSUMPTION.—(Galls.), av., 30,000. FINANCIAL.—Cost, $17,000. MANAGEMENT.—Rept. by E. Herbrick, Clk., June 15, '96. SEWERS.—None.

14. **BOWLING GREEN,** Wood Co. (3,467.) Built in '93 by Bowling Green Water Co. Contrs., Ohio Construction Co. FRANCHISE.—30 yrs. from '93; does not provide for purchase of works by city. Rates are not fixed in franchise, nor subject to regulation by city, except in case of public service. Co. is not exempt from local taxes. City to pay about $80 per hydrant per yr. LEGAL DIFFICULTIES.—City claims mains were frozen on two occasions; case in court. See note. SUPPLY.—Wells, 200 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Laidlaw-Dunn-Gordon. Deep well pumps are used. Bituminous screenings are used; av. cost, $2.25 per short ton, delivered in bin. STAND-PIPE.—Cap., 165,000 galls.; iron; 16 × 110 ft. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, about 5 miles; cost extensions met by Co. Taps, made by licensed plumbers under direction of Co., no fee. Hydrants, about 80. FINANCIAL.—Cost, about $70,000. Expenses: Operating, $3,500 to $4,000; taxes, $500. Revenue: Consumers, about $2,000; City, fire protection, $6,000. MANAGEMENT.—Prest., W. M. Carlisle, Mt. Gilead; Secy., A. W. Rudolph; Treas., A. E. Royce; Supt., D. E. Niver; Ch. Pump. Engr., Jas. De Hart. Rept. by Secy., Dec. 12, '96. SEWERS.—Has storm sewers. NOTE.—Press rept., Feb., '97, stated Jury in Court Common Pleas had just returned verdict, awarding Co. $2,434 of $3,000 for public service in dry seasons of '94 and '95; city claimed that service was deficient and that lawn service was "entirely restricted at times."

15. **BRIDGEPORT,** Belmont Co. (3,369.) Built by village. SUPPLY.—Martins' Ferry works. DISTRIBUTION.—Mains, 6 miles. Taps, 390. Hydrants, public, 44. MANAGEMENT.—Rept. by Chas. S. Moore, Supt. Martins' Ferry Works. SEWERS.—Has sanitary and storm sewers.

30. **BROOKLYN,** Cuyahoga Co. Now part of Cleveland, which see.

16. **BRYAN,** Williams Co. (3,068.) Built in '93 by city; put in operation in Mar. Engr., J. C. Grim. SUPPLY.—Nine wells, pumping direct. PUMPS.—Two Hughes. Bituminous lump coal used; av. cost, $2.60 per short ton delivered. FISCAL YEAR CLOSED Mar. 11. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by construction fund. Taps, 308; made by consumer. Services, galv. i.; with 18 ins. of lead; paid for by property owner. Use of meters optional with consumer. Hydrants, public, 76. CONSUMPTION.—(Galls.), av., 1,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. One steam fire engine in reserve. FINANCIAL.—Cost, $39,000. Bonded debt, $45,000, at 5%. Sinking Fund: $1,500. Expenses: Operating, $2,100. Revenue: Consumers, unmetered, $1,865. MANAGEMENT.—Prest., J. P. Caldwell; Secy., J. Schleenbaker; Treas., W. P. Franks; Supt., J. J. Bucklow; Ch. Pump. Engr., James Collier. Rept. by Secy., June 20, '96.

17. **BUCYRUS**, Crawford Co. (5,974.) Built in '83-4 by Bucyrus Water Co. FRANCHISE.—14 yrs. from '95 (previously reported as originally for 30 yrs). Rates are regulated by city ordinance. Co. is not exempt from local taxes. City to pay $5,100 per yr. for public service. LEGAL DIFFICULTIES.—"Too numerous to mention." SUPPLY.—Well and Sandusky River, pumping direct. Well is 50 x 20 ft. PUMPS.—Cap., 3,000,000 galls.; 1,500,000 Holly-Gaskill rotative; 2—750,000 Walker. West Virginia bituminous coal used; av. cost, $2.40 per short ton delivered. FILTERS.—Cap., 750,000 galls.; Hyatt (New York). FISCAL YEAR CLOSED Nov. 1. DISTRIBUTION.—Mains, 12 miles. Taps, 480; made by Co., for $8 to $12. Services, lead; paid for by consumer. Meters: 135; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 101. CONSUMPTION.—(Galls.), av., 550,000; max., 800,000; min., 500,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 to 120 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $60,000, at 6%. MANAGEMENT.—Prest., Jas. B. Gormley; Secy. and Treas., Henry B. Smith, Bay City, Mich.; Supt., Frank P. Kaler; Ch. Pump. Engr., Henry Miller. Rept. by Mich. Pipe Co., Bay City. PROJECTED IMPROVEMENTS.—Storage reservoir; Cap., 80,000,000 galls., for which land has been purchased. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 31, '84.

18. **CADIZ**, Harrison Co. (1,716.) Built in '95 by town; put in operation in Oct. Engr., L. E. Chapin, Canton; Contr., L. G. Hallock, Wheeling, W. Va. SUPPLY.—Drilled wells, pumping to reservoir and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 comp. non-cond. Feb., '95, village was advertising for bids for air-lift plant with cap. of 288,000 galls. per day. Bituminous coal used; av. cost, $1 per short ton. RESERVOIRS.—Cap., 800,000 galls.; storage. DISTRIBUTION.—Mains, 2.3 miles; cost extensions paid by council and charged to water-works. Taps, 160. Services, galv. i.; paid for by consumer. Meters, 0; yearly rental, free at present; any consumer may have one. Hydrants, public, 50. CONSUMPTION.—(Galls.), av., 60,000; max., 40,000. PRESSURE.—Ordinary, 20 to 60 lbs., fire, 60 to 100 lbs. FINANCIAL.—Cost, $26,500. Expenses: Operating, $1,500. MANAGEMENT.—Trustees: J. C. Moore, W. S. Cessua, W. L. Houser. Rept. by Lew I. Ward, Aug. 24, '96. SEWERS.—None.

19. **CAMBRIDGE**, Guernsey Co. (4,361.) Under construction in '96 by city. Engr., E. C. Cooke, Cleveland. SUPPLY.—Wills Creek, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 (makers rept. 3,000,000) galls.; 2—750,000 Laidlaw dup. FILTERS.—Cap., 750,000 galls.; probably gravity. RESERVOIR.—Impounding, on Wills Creek, formed by pile dam 6 ft. high above low water. STAND-PIPE.—Cap., 220,000 galls.; steel; 25 x 60 ft. DISTRIBUTION.—Mains, 11 miles. Hydrants, public, 111. FINANCIAL.—Cost, $60,000. MANAGEMENT.—Secy., W. V. Garvin. Rept. by O. M. Hoge, Cy. Engr., June 15, '96. SEWERS.—None.

20. **CANAL DOVER**, Tuscarawas Co. (3,470.) Built in '96 by city; put in operation March 1. Engr., L. E. Chapin; Contrs., McQueren & Co., both of Canton. SUPPLY.—Drilled wells, pumping to stand-pipe. Wells are 4 to 6-in. in diam., 52 ft. deep, with 40 ft. of water. PUMPS.—Cap., 1,500,000 galls.; 2—750,000-gall. Worthington comp. non-cond. Bituminous coal used; av. cost, $1 per short ton. STAND-PIPE.—Cap., 150,000 galls.; steel; 16 x 100 ft., on stone foundation, located in highest part of town. FISCAL YEAR CLOSES Mar., '97. DISTRIBUTION.—Mains, 9 miles; cost extensions met by income. Taps, 174; made by city for $5, including service to curb. Services, galv. i. Meters: 2; owned, controlled and repaired by city; yearly rental, 20% of cost. Use of meters, compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 78. CONSUMPTION.—(Galls.), av., 86,700; max., 160,000; min., 30,000. PRESSURE.—Ordinary, 60 lbs. One steam fire engine is used. FINANCIAL.—Cost, $37,000. Bonded debt, $35,000, at 5%. Expenses (for 6 mos.): Operating, $600. Revenue: Consumers, unmetered, $600; metered, $200. MANAGEMENT.—Trustees: Jos. Mully, Thos. Kemp and F. Bernhard. Secy., W. C. Deardoff; City Treas., Thos. Haley. Rept. by Supt., Jas. T. King, Oct. 28, '96. SEWERS.—None.

21. **CANTON**, Stark Co. (26,189.) Built in '69 by city. No legal difficulties. SUPPLY.—36 artesian wells, creek and natural springs, pumping direct. PUMPS.—Cap., 13,000,000 galls.; 3,000,000 and 2,000,000 Worthington comp. cond.; 1—8,000,000 Gaskill. Bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 4,000,000 galls.; storage. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 48 miles; cost extensions met by revenue. Taps, 3,900; made by city. Services, galv. i.; paid for by city. Meters: 20; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for factories and elevators. City can compel use of meters and any consumer may have one. Hydrants, public, 303; private, 30. CONSUMPTION.—(Galls.), av., 3,000,000; max., 8,000,000; min., 2,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $450,000. Bonded debt, $190,000, at 5%. No sinking fund. Expenses: Operating, $17,000. Revenue: City, none. MANAGEMENT.—Prest., D. Borden; Secy., F. E. Marberger; Supt., A. M. True. Rept. by Supt., June 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 24, '84.

22. **CAREY**, Wyandot Co. (1,605.) Built in '95 by city. Engr., J. S. Humphrey, Findlay; Contrs., Snyder & Frederick. SUPPLY.—Wells, 8-in. in diam. and 60 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Laidlaw-Dunn-Gordon. Hocking Valley bituminous coal used; av. cost, $2.50 per short ton. STAND-

PIPE.—Cap., 172,000 galls.; steel; 16 × 115 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 4 miles. Taps, 100; made by city. Services, galv. I.; paid for by city to curb. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 41. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $28,000, including 7 acres of land. Bonded debt, $25,000, at 5%. MANAGEMENT.—Prest., H. Graves; Secy., H. Newhard; Supt., Wm., Will. Rept. by J. A. Gibb, Oct. 29, '96. SEWERS.—None.

23. **CARROLLTON,** Carroll Co. (1,228.) Built in '96 by city; put in operation Apr. 24. Engr., L. E. Chapin; Contrs., McQueren & Co., both of Canton. SUPPLY.—Five 8-in. drilled wells, 100 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. non-cond. Bituminous lump coal used; av. cost, $1.45 per short ton. STAND-PIPE.—Cap., 109,000 galls.; steel, 16 × 73 ft. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by water fund. Taps, 90; made by city for $5. Services, galv. I.; paid for by consumer. Meters, 0. City can compel use of meters, and any consumer may have one. Hydrants, public, 46. CONSUMPTION.—(Galls.), av., 12,000; max., 18,000; min., 8,000. PRESSURE.—Ordinary and fire, 60 to 100 lbs. FINANCIAL.—Cost, $25,500. Bonded debt, $25,000, at 5%, due semi-annually. Expenses: Operating, about $600; int., $1,250. Revenue, $511: Consumers, unmetered, $450; R. R. Co., $60. Deficits are met by taxation. MANAGEMENT.—Prest., H. J. Eckley; Secy., W. S. Hoops; Supt. and Ch. Pump. Engr., E. L. Swan. Rept. by J. W. Cameron, Jan. 11, '97. SEWERS.—None.

24. **CARTHAGE,** Hamilton Co. (2,257.) Built in '90-1 by village; put in operation May 24. SUPPLY.—Deep wells, 1—6-in. and 2—8-in., pumping direct. PUMPS.—Cap., 2,000,000 (?) galls.; Laidlaw-Dunn-Gordon; one deep well and one dup. Mine run bituminous coal used; av. cost, $1.95 per short ton. RESERVOIR.—Cap., 120,000 galls.; storage. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 7¾ miles; cost extensions met by tax levy. Taps, 210; made by village, including service pipe at 60 cts. per ft. for ¾-in. to $1.05 per ft. for 1-in. Services, lead; paid for by consumer to curb. Meters, 11; owned and repaired by consumer; controlled by village. Use of meters compulsory for manufacturers, livery stables and large consumers. Village can compel use of meters and any consumer may have one. Hydrants, public, 49; private, 2. CONSUMPTION.—(Galls.), av., 45,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $25,000, at 5%, due yearly from 1910 to '15. Water-works are combined with electric light plant. Expenses: Operating, $3,814. Revenue: Consumers, $2,600; other purposes, $1,933. MANAGEMENT.—Trustees. Prest., Chas. E. McCammon; Secy., Harry Simms; Treas., Wm. Wiche; Supt. and Ch. Pump. Engr., Chas. Weisbrod. Rept. by Secy., Aug. 22, '96. SEWERS.—None.

25. **CELINA,** Mercer Co. (2,702.) Built in '95 by city. Engrs., Voorhees & Witmer, Buffalo. Contrs., Carothers & Crane, Newport, Ky. SUPPLY.—Pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Laidlaw-Dunn-Gordon. STAND-PIPE.—Cap., 180,000 galls.; steel, 16 × 125 ft. DISTRIBUTION.—Mains, about 14 miles. Hydrants, public, 101. FINANCIAL.—Contract price, $36,780. NOTE.—Above subject to corrections as it is based on contract figures (verified by statement that works are in use).

P 1. **CHAGRIN FALLS,** Cuyahoga Co. (1,243.) People voted $35,000 bonds for works in Aug., '96. Engr. for preliminary surveys, Burton J. Ashley, Opera House Block, Chicago. Supply, by gravity to reservoir, thence pumped to reservoir. Rept. by Mayor, S. L. Wilkinson, Dec. 11, '96. Press rept., Feb. 16, '97, stated opposition to proceeding with construction had just been defeated in election at which J. W. Hutchins and others were elected W.-W. Trustees.

26. **CHILLICOTHE,** Ross Co. (11,288.) Built in '81-2 by Chillecothe Gaslight & Water Co. FRANCHISE.—Perpetual. Does not provide for purchase of works by city. Rates are fixed by contract with city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Well on bank of Scioto River, pumping to reservoir. PUMPS.—Cap., 3,500,000 galls.; 2,000,000 non-comp. non-cond. and 1,500,000 Worthington. Hocking and Wellston bituminous nut and slack coal used; av. cost, $1.15 per short ton. RESERVOIR.—Cap., 3,500,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (in '90), 23 miles; cost extensions met by profits. Taps, made by Co. for $8. Services, lead and iron; paid for by Co. to curb. Meters: 50; owned by Co. and consumer; controlled by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 135. CONSUMPTION.—(Galls.) max., 700,000; min., 400,000. PRESSURE.—Ordinary and fire, 95 lbs. FINANCIAL.—Cost, $300,000. Cap. Stock: Authorized, $225,000; paid-up, $100,000. Bonded debt, $100,000, at 5%. MANAGEMENT.—Prest., F. A. Stacey; Secy., A. C. Kopp; Treas., Thos. G. McKall; Supt., V. Blankenship. Rept. by Secy., Nov. 10, '96. SEWERS.—In contemplation.

27, 28. **CINCINNATI,** Hamilton Co. (296,908 + 8,983, or more, annexed since '90.) Bought by city in '39; built in '20, by Saml. Davis, who organized Cincinnati Water Co. in '26. Avondale, Clifton, Linwood, Riverside and Westwood annexted to city about Jan. 1, '96. Linwood had complete works, built by village in '94. The other places named owned distribution systems and bought water from Cincinnati. The Clifton pipe system was put down in '83, the Avondale, prior to '90, and the others since that date. Cincinnati assumed an aggregate of $234,000 bonds on account of these plants. The Linwood

works, having an independent pump system, are described separately below. Rept. does not state whether or not figures for annexed districts are included in Cincinnati figures, but presumably they are.

MAIN WORKS.

SUPPLY.—Ohio River, pumping to reservoir, stand-pipe and tanks. PUMPS.—No information given for this Manual. Manual for '89-'90 gave total cap. as 73,000,000 galls. of which 31,500,000 was Worthington and balance mostly or wholly of special design. Manual for '90-1 stated contract had been let for 4—5,000,000 Wilson & Snyder pumps. Makers of pumps named below rept. pumps furnished by them as follows: Laidlaw-Dunn-Gordon: 4,000,000 in '90 and 6,000,000 in '91. Barr: 3—2,500,000 dup. direct acting; 2—10,000,000 on old Nos. 7 and 8 Scowden steam ends at Front St. station. Worthington: 2—12,500,000 vert. comp. cond.; 1—6,000,000 comp. high duty; 1—2,000,000; 1—1,000,000 comp. non-cond.; 1—500,000 non-comp. non-cond. Holly-Gaskill: 2—6,000,000 hor. high duty. Kanawha bituminous gas coal used; av. cost, $1.45 per short ton. RESERVOIRS.—Cap., 105,000,000 galls.; storage: Eden Park: 100,000,000 and Third St.: 5,000,000. TANKS.—Five. Two of these are 60 × 38 ft., with combined cap. of 1,400,000 galls., built in '69 and '70, on Mt. Auburn; others built since '90. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 33 miles; cost extensions met by revenue. Taps, 46,000. Services, lead; paid for by consumer. Meters, 3,000; owned and repaired by consumer; controlled by city. Use of meters compulsory for various classes. City can compel use of meters and any consumer may have one. CONSUMPTION.—(Galls.) av., 47,143,068; max., 65,220,702; min., 28,768,291. PRESSURE.—Ordinary, 35 lbs.; av., 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $9,087,695. Bonded debt, including that of annexed districts, $1,409,500: $300,000 at 7%, due Aug. 1, '97; $178,000 at 6%, due $175,000 in 1900 and $3,000 in 1904; $700,000 at 4%, due $400,000 in 1902, $100,000 in '04, $200,000 in '11; $219,000 at 4%, due $20,000 in 1906, $75,000 in '07, $20,000 in '15, $69,500 in '23 and $35,000 in '30; $12,000 at 4½%, due in 1922. Sinking fund, $329,000. Expenses: Operating, $527,446; int., not including that on debt of annexed territory, about $60,000. Revenue, $780,423; Consumers, unmetered, $507,950; metered, $212,870; elevators, $59,603. MANAGEMENT.—Prest., August Herrmann; Treas., J. C. Whetsone; Ch. Pump. Engr., W. Meredith. Rept. by Engr. and Supt., Willis P. Tharp, June 17, '96. In '96 authority was secured to issue $6,500,000 of bonds for new supply and commission consisting of August Herrmann, Chn., T. W. Graydon and others was appointed. Act providing for works was declared constitutional by State Supreme Court in Feb., '97. Rept. on new works was made early in '96 by Geo. H. Benzenberg, Milwaukee; Jno. W. Hill, Cincinnati; and Saml. Whinery, Cincinnati. Rept. advised new pumping station on Ohio River, above city; 6—50,000,000-gall. settling reservoirs; 11—6,000,000-gall. filter beds; 2—100,000,000-gall. reservoirs; 8—20,000,000-gall. triple exp. pumping engines; two 60-in. c. i. force mains to settling reservoirs, and to supply reservoirs, respectively; 78-in. c. i. supply main. The works would supply 60,000,000 galls. a day at the start, and 120,000,000 galls., ultimately. SEWERS.—Has sewers. REFERENCES.—Eng. News, Apr. 16, 23, '81; stand-pipe failure, July 9, '81, Oct. 6, '88, Apr. 12, '94; report, July 15, '82; quality of supply and typhoid, July 28, '92; examination of supply, Feb. 2, '93; history of supply, and also abstract of expert report on new supply, Apr. 2, '96.

LINWOOD PLANT.

Built in '94 by former village of Linwood; put in operation in Mar. Des. Engr., Geo. Hornung, Cincinnati. SUPPLY.—Driven wells, pumping to reservoir for low service and to elevated tank for high service. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Laidlaw-Dunn-Gordon comp. non-cond. dup., with outside packed plunger. Ohio bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 500,000 galls.; storage and distributing, 290 ft. above floor of power-house. TANK.—Cap., 64,500 galls.; steel; 20 × 25 ft., conical bottom; on steel trestle 70 ft. high, tank bottom 370 ft. above power-house floor. DISTRIBUTION.—Mains, 6 miles; cost extensions met by general taxation. Taps, 250; made by city. Services, lead; paid for by consumer. Meters: 5; owned and repairs paid by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $54,000. Debt, $72,000, bonded at 5%. Expenses: Operating, $2,100. Revenue: Consumers, $1,500. MANAGEMENT.—Rept. by Des. Engr., Jan., '97. SEWERS.—None.

29. **CIRCLEVILLE**, Pickaway Co. (6,556.) Built in '86-7 by Circleville Water Supply Co. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city, price to be determined by three appraisers. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $35 each for first 100 hydrants and $30 for each additional one. LEGAL DIFFICULTIES.—No legal difficulties. SUPPLY.—Filter gallery on Darby Creek, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Gaskill comp. cond. dup. FILTER GALLERY.—In sand and gravel, 615 ft. long. RESERVOIR.—Cap., 14,000,000 galls.; impounding. STAND-PIPE.—Cap., 426,600 galls.; iron; 22 × 150 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 14½ miles; cost extensions met by earnings. Taps, 754; made by Co., free. Services, galv. i. and lead; paid for by Co. to curb. Meters: 14; owned, controlled and repaired by Co.; yearly rental, $1.20. Use of meters optional with consumer; compulsory for factories and mills. Hydrants, pub-

lic, 140. CONSUMPTION.—(Galls.) av., 750,000. PRESSURE.—Ordinary, 50 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $150,000. Cap. Stock: Authorized, $150,000; all paid-up. Bonded debt, $150,000, at 6%. Expenses: Operating, $5,000; taxes, $700. Revenue: Consumers, $7,100; City, fire protection, $4,580. MANAGEMENT.—Prest., C. C. Pomeroy; Secy. and Treas., C. E. Kimball, both of 45 Wall St., N. Y. City; Supt., Geo. R. Haswell; Ch. Pump. Engr., W. E. Haswell. Rept. by H. H. Bowby, 45 Wall St., N. Y. City, June 24, '96. SEWERS.—Has storm sewers only.

30. **CLEVELAND,** Cuyahoga Co. (261,353 + 8,702, or more, annexed since '90.) Built in '54-6 by city. Cleveland Water Co. was incorp. in '38; in '50 its privileges were extended and its authorized cap. stock increased to $200,000, but it never did any work. Supplies Glenville and Lakewood. Brooklyn and West Cleveland built distribution systems in '88 and '78, respectively, and bought water through meter until annexed to Cleveland in about '94. SUPPLY.—Lake Erie, pumping to reservoirs. PUMPS.—Low Service: Cap., 85,000,000 galls.: 3—10,000,000 comp., and 1—20,000,000 Worthington high duty; 1—15,000,000 and 1—20,000,000 Knowles comp. High Service: Cap., 8,000,000 galls.; 2—4,000,000 Cornish. (Makers rept. 20,000,000 Allis vert. triple exp.; probably contracted for in '96.) Coal used: Belle Vernon (Pa.) nut, $1.40, and slack, $1.25 per short ton; Lisbon (O.) mine run, $1.44; all delivered. RESERVOIRS.—Cap., 117,000,000 galls. Fairmount St., 80,000,000; Kinsmore St., 37,000,000. STAND-PIPE.—Cap.,1,130,000 galls.; 36 × 148 ft., operated in connection with Cornish pumps. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 462 miles; cost extensions met by earnings. Taps, 44,666; made by city for $5. Services, lead to curb; paid for by property owner. Meters: 2,029; 1,839 owned by city, 190 by consumers; controlled and repaired by city at consumer's expense. City can compel use of meters and any consumer may have one if set at his own expense. Hydrants, public, 5,282. CONSUMPTION.—(Galls.) av., 47,154,366; max., 69,000,000; min., 33,000,000. PRESSURE.—Ordinary, 20 to 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $7,823,605. Bonded debt, $1,796,000: $100,000, at 3.65%, due in 1902; $500,000, at 4%, due in 1903 and '05; $400,000, at 4½%, due in 1902; and $796,094, at 6%, due in '97 to 1900 and 1903. Expenses: Operating, $170,231; int., $92,150. Revenue, $583,156: Consumers, unmetered, $362,819; metered, $213,974; other purposes, $6,863. MANAGEMENT.—Dir. Pub. Wks., Darwin E. Wright; City Treas., Chas. W. Chase; Supt., M. W. Kingsley; Ch. Pump. Engr., Henry Bottenhorn. Rept. by Supt., June 9, '96. PROJECTED IMPROVEMENTS.—New tunnel, 9 ft. diam., 26,000 ft. long to intake crib in Lake Erie. Press repts. state contract for tunnel was awarded in Aug., '97, to W. J. Gawne, Cleveland, at $18.15 per ft.; also that contract for steel intake protection crib was awarded in Dec., '96, to Van Dorn Iron Works Co., Cleveland, for $137,393. Feb., '97, press rept. stated 160 ft. of tunnel had been driven. SEWERS.—Has combined sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 26, May 3, 10, June 14, '79; Apr. 23, '81; submerged pipe laying, Mar. 19, '92, illus.; stand-pipe accident, Apr. 5, '94; rept. on new supply, Feb. 20, '96. Early in '96, Rudolph Hering, N. Y. City; Geo. H. Benzenberg, Milwaukee; Desmond FitzGerald, Brookline, Mass., with M. E. Rawson, Chf. Engr., and M. W. Kingsley, Supt. W.-W., as ex-officio members, rept. on improvements to water supply, in which tunnel extension was recomended.

27. **CLIFTON,** Hamilton Co. Now part of Cincinnati, which see.

31. **CLYDE,** Sandusky Co. (2,327.) Built in '83-4 by city; enlarged in '93. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon & Maxwell, one comp. cond., other high pressure. FISCAL YEAR CLOSED Mar. 16. DISTRIBUTION.—Mains, 8 miles. Taps, 400. Services, galv. i. Meters, 25. Hydrants, public, 51. FINANCIAL.—Cost, $37,000. Bonded debt, $23,000, at 6%. Expenses: Operating, $2,300. Revenue, $2,500. MANAGEMENT.—Prest., Winfield Adare; Secy., W. E. Gillett; Treas., H. B. Tiffany. Rept. by Secy., Sept. 29, '96.

32. **COLUMBIANA,** Columbiana Co. (1,112.) Built in '95 by village; put in operation Dec. 1. Engr., W. H. Ashwell, Detroit, Mich. Contrs., Enterprise Mfg. Co. SUPPLY.—Well in rock 30 × 35 ft., pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Stilwell-Bierce dup. Bituminous coal used; av. cost $1 per short ton. FISCAL YEAR CLOSED Dec. 1, '96. DISTRIBUTION.—Mains, 6 miles. Taps, 111. Services, lead; paid for by city to curb. Use of meters optional with consumer. Hydrants, public, 40. PRESSURE.—Ordinary, 80 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $28,000, at 5%. Expenses: Operating, $1,200. Revenue: Consumers, unmetered, $675. MANAGEMENT.—Prest., E. J. Wolfgang; Secy., John E. Allen; Treas., Geo. H. Webb; Supt., Frank Bell; Ch. Pump. Engr., Frank Matlin. Rept. by Prest., Jan. 13, '97. SEWERS.—None.

33. **COLUMBUS,** Franklin Co. (88,150.) Built in '70 by city. SUPPLY.—Ground water and direct connection with Scioto River at West Side Station; tubular wells at East Side Station; pumping direct. Filter basins and galleries previously rept. as in use. PUMPS.—Cap., 49,000,000 galls.; Holly horizontal, 2—12,000,000 and 1—10,000,000; 2—7,500,000 vertical triple comp. Bituminous lump coal used; av. cost, $1.50 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 150 miles; cost extensions met by revenue. Taps, 13,000; made by city for $7.50 to $20, according to degree of street improvement. Services, lead and galv. i.; paid for by owner. Meters: 1,400; owned by consumer; controlled and repaired by city; yearly rental, none. City

can compel use of meters and any consumer may have one. Hydrants, public, 1,100. CONSUMPTION.—(Galls.) av., 14,000,000; max., 20,000,000; min., 8,000,000. PRESSURE. —Ordinary and fire, 70 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,117,700. Bonded debt, $1,100,000, at 4%. Expenses: Operating, $64,000. MANAGEMENT.—Secy. and Treas., John Zuber. Rept. by Supt. and Ch. Pump. Engr., A. H. McAlpine, June 15, '96. PROJECTED IMPROVEMENTS.—New supply. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 13, '81; Gaskill pumps, Apr. 20, '93.

34. **CONNEAUT,** Ashtabula Co. (3,241.) Built in '90 by Conneaut Water-Works & Supply Co.; put in operation Jan. 1, '91. FRANCHISE.—20 yrs. from '90; provides for privilege of purchase of works by city after 10 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay ('90-1 Manual) $37.50 each for first 75 hydrants and $35 for each additional. No legal difficulties. SUPPLY.—Wells on shore of Lake Erie, emergency intake in the lake, pumping direct to stand pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Hughes comp. Bituminous coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 282,000 galls.; steel; 20 × 120 ft. DISTRIBUTION.—Mains, 16½ miles. Taps, 745; made by Co. for $7. Services, galv. i.; paid for by consumer. Meters: 31; owned and repaired by consumer; controlled by Co.; yearly rental, none. Use of meters compulsory for R. Rs., factories, hotels and stables. Co. can compel use of meters and any consumer may have one. Hydrants, public, 105. CONSUMPTION.—(Galls.), av., 376,800. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cap. Stock: Authorized, $125,000; all paid-up; paid no div'd. Bonded debt, $125,000, at 6%, due 1910. Expenses: Int., $7,500; taxes, $700. MANAGEMENT.—Prest., H. Davis Northup, Fort Edward, N. Y.; Secy., H. A. Garfield, Cleveland. Rept. by Treas. and Genl. Mgr., H. De C. Richards, N. Y. City, July 15, '96. SEWERS.—Has sanitary sewers.

35. **CONTINENTAL,** Putnam Co. (Est., 891.) See Marice City.

F 2. **CORNING,** Perry Co. (1,551.) Built by town for fire protection only. Supply drilled well, 45 ft. deep, and two surface wells, 25 ft. deep, lifted by 57,000-gall. Pulling pumps to two tanks. Bituminous coal used; av. cost, $1.50 per short ton. Mains, 1½ miles. Taps, 18. Meters, 0. Hydrants, 15. Consumption, 2,000 to 5,000 galls. Pressure, 40 lbs. Cost, $10,000. Operating expenses, $720. Management, Com.: Geo. J. Frasch, M. J. Clifford and A. Rankin, Supt. Rept. by G. J. Frasch, Nov. 4, '96.

36. **COSHOCTON,** Coshocton Co. (3,672.) Built in '90-1 by village. SUPPLY.—18 6-in. wells, pumping to distributing reservoir. PUMPS.—Cap., 1,076,000 galls.; 1—376,000 Hughes dup. and 1—700,000 Worthington. Bituminous mine run coal used; av. cost, 75 cts. per short ton. RESERVOIR.—Cap., 330,000 galls.; distributing, circular, covered; 250 ft. above, 9,400 ft. from pumping station. DISTRIBUTION.—Mains, 9 miles; cost extensions met by revenue and appropriations by city council. Taps, 700; made by city, free, including service to curb. Services, ¾ galv. i.; paid for by city. Meters, 8; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city; compulsory for manufacturers. Hydrants, public, 95. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 110 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $70,000. Bonded debt, $55,000, at 6%. Expenses: Operating, $4,400; int., $3,300. Revenue, $5,500. MANAGEMENT.—Supt., D. A. Raiff; Ch. Pump. Engr., John Craig. Rept. by Supt., July 20, '96. PROJECTED IMPROVEMENTS.—Large well and new pumping engine. SEWERS.—None. REFERENCE.—Eng. News, Apr. 15, '91.

37. **CRESTLINE,** Crawford Co. (2,911.) Built in '69-70 by city. SUPPLY.—Springs, by gravity from collecting reservoir. (Maker's rept. 1,000,000 Worthington comp. noncond. pump.) RESERVOIR.—Cap., 1,500,000 galls.; 127 ft. above city. DISTRIBUTION. —Mains, 10 miles. Taps, 241. Meters, 1. Hydrants, 40. FINANCIAL.—Cost, $120,000. Bonded debt, $10,000, at 5%; $5,000 paid annually. Sinking Fund, $900. Expenses, $1,350: Operating, $600; int., $750. NOTE.—No rept. since '90-1 Manual. REFERENCE. —Eng. News, Jan. 6, '83.

38. **DALTON,** Wayne Co. (610.) Built in '95 by village for general supply. Consult. Engr., L. E. Chapin, Canton. Contr. (press rept.), H. D. Shannon, Orrville. SUPPLY.—Deep well, by pumping. RESERVOIR.—(Receiving?), 40 × 15 ft. DISTRIBUTION.—Mains, 1½ miles. FINANCIAL.—Contract price (press rept.), $6,856. NOTE.—Subject to correction, being from official advertisement and press rept.

39. **DAYTON,** Montgomery Co. (61,220.) Built in '69-70 by city. SUPPLY.—87 8-in. tubular wells, pumping direct. PUMPS.—Cap., 29,000,000 galls.; 10,000,000 and 15,000,000 Holly-Gaskill hor. comp., crank and fly wheel; 1—4,000,000 Holly quadruplex. Jefferson Co. (O.) bituminous lump coal used; av. cost, $2 per short ton. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains, 100 miles; cost extensions met by earnings and bonds. Taps, 8,900; in use, 6,400; made by city at $1 for ½-in. to $2 for 1-in. Services, lead to property line; paid for by consumer at 13 cts. per ft. for excavating to property line. Meters, 1,500; owned by city up to 2-in.; controlled by city; repairs paid by owner; yearly rental, $2. Use of meters compulsory for all services difficult to assess. City can compel use of meters and any consumer may have one. Hydrants, public, 940; private, 40. CONSUMPTION.—(Galls.) av., 3,829,443; max., 6,750,070. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Steam fire engines are used and direct pressure. FINANCIAL.—Cost, $1,200,000. Bonded debt, $765,000. Expenses: Operating, $35,400; int., $32,000. Revenue: Consumers, unmetered, $50,000; metered, $21,000. Bonds due and int. met by

general taxation. MANAGEMENT.—Prest., R. T. McGregor; Secy., Chas. E. Rowe; Supt., Chas. Eckstein; Ch. Pump. Engr., J. C. Merkle; Rept. by Secy., June 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 30, '81.

40. **DEFIANCE,** Defiance Co. (7,694.) Built in '87-8 by Defiance Water Co. FRANCHISE.—30 yrs. from '87; provides for purchase of works by city in '97 or at end of any succeeding 5 yrs. Rates subject to regulation by city. Co. is not exempt from local taxes. City to pay for fire hydrants. SUPPLY.—Maumee River, pumping to stand-pipe. PUMPS.—Cap., 4,000,000 galls. 2—2,000,000 Blake comp. cond. dup. STAND-PIPE.—Cap., 329,000 galls.; iron; 20 × 140 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 18 miles. Taps, 540; made by consumer. Services, galv. i. and lead; paid for by property owner. Meters: 27; owned, controlled and repaired by Co. Use of meters compulsory for factories, hotels and livery stables. Co. can compel use of meter and any consumer may have one by agreeing to minimum rate. Hydrants, public, 162; private, 1. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 55 lbs. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $200,000, at 6%. MANAGEMENT.—Prest., A. F. Callahan, Louisville, Ky.; Secy., S. M. Stevens, Newport, R. I.; Treas., C. W. McLellan, New York. Rept. by Supt., G. M. Eldridge, June 4, '96. SEWERS.—Has combined sanitary and storm sewers. REFERENCES.—Stand-pipe failure, Eng. News, Apr. 4, 11, '91; Mar. 16, '93; May 3, '94.

41. **DELAWARE,** Delaware Co. (8,224.) Built in '88-9 by Delaware Water Co. FRANCHISE.—20 yrs. from '89; provides for purchase of works by city after 10 yrs. Rates are fixed in franchise and subject to regulation by city. Co. is not exempt from local taxes. City to pay $8,240 per yr. for hydrant rental. No legal difficulties. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Dean comp. dup. Av. cost of coal, $1,90 per short ton. STAND-PIPE.—Cap., 237,000 galls.; 20 × 100 ft., on stone foundation. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 22 miles. Taps, made by Co. for $1.50. Services, iron; paid for by consumer. Meters: 360; owned by Co. and consumer; yearly rental varies according to size of meter. Co. can compel use of meters and any consumer may have one. Hydrants, public, 222; private, 2. CONSUMPTION.—(Galls.) av., 300,000; max., 400,000; min., 250,000. PRESSURE.—Ordinary, 63 lbs.; fire, 100 lbs. FINANCIAL.—(In '89.) Cost, $200,000. Bonded debt, $180,000, at 6%. MANAGEMENT.—Prest., E. F. Poppleton; Secy., Treas. and Supt., C. W. Wiles; Ch. Pump. Engr., W. S. Green. Rept. by Supt., June 5, '96. PROJECTED IMPROVEMENTS.—Air lift pump for deep wells. SEWERS.—None.

42. **DELPHOS,** Allen Co. (4,516.) Built in '96 by city for general use; was to be in operation about Dec. 25. Engr., R. H. Gamble, Lima, O. Contrs., Shaw-Kendall Engr. Co., Toledo. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). FINANCIAL.—Contract price, $62,600. MANAGEMENT.—Trustees. Rept. by Clk., G. F. Alny, June 15 and Dec., 96.

43. **DENNISON AND UHRICHSVILLE,** Tuscarawas Co. (Dennison, 2,925; Uhrichsville, 3,842.) Built in '88 by Dennison Water Supply Co. FRANCHISE.—20 yrs. from '87; provides for purchase of works by Dennison in 1908 and Uhrichsville in 1908, price to be determined by arbitration. Rates are subject to regulation by city. Dennison to pay $2,420 and Uhrichsville $2,320 per annum. No legal difficulties. SUPPLY.—Big Stillwater Creek, pumping to reservoir; filtered. PUMPS.—Cap., 3,000,000 galls.: 2,000,000 Holly hor. dup.; 1,000,000 Worthington simple high pressure. Bituminous coal used; av. cost, $1.50 per short ton. FILTER.—Broken stone and gravel. Filter gallery 190 ft. long, ending in 25 × 24-ft. well previously rept. RESERVOIR.—Cap., 3,500,000 galls.; distributing. FISCAL YEAR CLOSED Oct. 31, '95. DISTRIBUTION.—Mains, 13 miles; cost extensions met by earnings. Taps, 650; made by Co. at cost. Services, lead; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 126. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $268,841. Cap. Stock: Authorized, $125,000; all paid-up; paid no div'd in '95. Floating debt, $9,454, at 6%; bonded debt, $125,000, at 6%, due 1908. No sinking fund. Expenses, $14,880: Operating, $6,057; int., $8,132; taxes, $691. Revenue, $17,628: Consumers, unmetered, $13,096; City, fire protection, $4,532. MANAGEMENT.—Prest., M. Moody; Treas., Murray Forbes, Greensburg, Pa.; Ch. Pump. Engr., J. C. Morrow. Rept. by Secy. and Supt., S. F. Potter, Aug. 31. SEWERS.—Has sanitary and storm sewers.

44. **EAST CLEVELAND,** Cuyahoga Co. (3,042.) Distribution system built in '96-7 by village and will be operated by it; mains "about one-half" laid, Dec., '96. SUPPLY.—Cleveland works, through meter. DISTRIBUTION.—Hydrants, 48. FINANCIAL.—Bonds: $35,000 were to be sold Sept. 19, '96. MANAGEMENT.—Rept. by Village Clk., H. B. Chapman, June, Aug. and Dec., '96.

45. **EAST LIVERPOOL,** Columbiana Co. (10,956.) Built in '79 by village. SUPPLY.—Ohio River, pumping to reservoir, with repumping for high service. PUMPS.—Low Service: Cap., 3,500,000 galls.; Gordon. High Service: Cap., 1,500,000 galls.; Cope & Maxwell. Both vert. cond., operated single or dup. Pittsburg nut coal used; av. cost, 65 cts. per short ton. RESERVOIRS.—Cap., 4,000,000 galls.: Low Service, 2,500,000 galls.; 335 ft. above base of pumps. High Service, 1,500,000; 220 ft. above base of high service pumps. FISCAL YEAR CLOSED March 20. DISTRIBUTION.—Mains, 21 miles;

cost extensions met by surplus income. Taps, 1,202; made by city for $1. Services, lead; paid for by consumer. Meters, 10; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for livery stables and street car cos. City can compel use of meters and any consumer may have one. Hydrants, public, 105; private, 32. CONSUMPTION.—(Galls.) av., 1,500,000 max., 1,600,000; min., 1,300,000. PRESSURE.—Ordinary, 80 to 120 lbs.; fire, 200 lbs., from upper reservoir. One steam fire engine is used. FINANCIAL.—Cost, $209,000. Bonded debt, $159,500, at 5%: $36,000 due 1907; $15,000 due 1918; $90,000 due 1920; $18,500 due 1923. Expenses, $20,475: Operating, $12,500; int., $7,975. Revenue, $23,000: Consumers, unmetered, $22,000; metered, $1,000; City, none. MANAGEMENT.—Prest., J. H. Harris; Secy., J. W. Gipner; Treas., S. T. Herbert; Supt., Philip Morley; Ch. Pump. Engr., E. Cox. Rept. by Secy., Aug. 7, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Feb. 11, '82.

46. **EAST PALESTINE,** Columbiana Co. (1,816.) Built in '89-90 by village. SUPPLY.—Four drilled wells, pumping through distribution to reservoir. PUMPS.—Cap., 750,000 galls.; Gordon dup. high-pressure. RESERVOIR.—Cap., 300,000 galls.; 50 ft. in diam.; covered and ventilated. DISTRIBUTION.—Mains, 3.7 miles. Hydrants, public, 36. FINANCIAL.—Cost, $23,500. Bonded debt, $25,000, at 5%. MANAGEMENT.—Trustees. NOTE.—No rept. since '90-1 Manual.

47. **EATON,** Preble Co. (2,934.) Built in '91 by city; put in operation March, '92. SUPPLY.—Ten driven wells and filter gallery, pumping to stand-pipe and direct. Direct connection with creek for fire service. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon. Jackson Hill coal used; av. cost, $2.25 per short ton. TANK.—Cap., 199,000 galls.; steel; 20 × 85 ft., on stone tower 50 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8.7 miles; cost extensions met by taxes and surplus, if any. Taps, 324; made by city, including service to curb. Services, lead; paid for by consumer; an advance is required, which is credited on water rent. Meters, 65; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for fountains, saloons, livery stables, hotels and motors. City can compel use of meters and any consumer may have one. Hydrants, public, 76. CONSUMPTION.—(Galls.) av., 55,151; max., 190,000; min., 30,000. PRESSURE.—Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $82,635. Bonded debt, $64,000, at 6%, to be paid as follows: $3,000 per year until 1903, then $4,000 until 1905, $5,000 until 1911. Operating, $2,182. Revenue: Consumers, $2,340; street sprinkling, $70. MANAGEMENT.—Prest., Andrew Hiestand; Secy. and Supt., W. C. Dove; Ch. Pump. Engr., I. J. Dove. Rept. by Supt., June 12, '96. PROJECTED IMPROVEMENTS.—New reservoir. SEWERS.—None.

48, P 2. **ELYRIA,** Lorain Co. (5,611.) Built in '79 by Elyria Gas & Water Co. FRANCHISE.—20 yrs. from '79. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. SUPPLY.—Black River, pumping from impounding reservoir to tank. PUMPS.—Cap., 2,500,000 galls.; Worthington: 1,500,000 simple high pressure, 1,000,000. Bituminous mine run coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 200,000,000 galls.; storage, formed by dam in river. TANK.—Cap., 135,000 galls.; iron; 34 × 20 ft., on stone tower, 84 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles; cost extensions met by revenue. Taps, 550; made by Co.; ⅝-in. for $3; ¾-in. for $4.50 and 1-in. for $6. Services, galv. i.; paid for by property owner. Meters, 0. Use of meters optional with Co. Hydrants, public, 69. CONSUMPTION.—(Galls.) av., 900,000; max., 1,500,000; min., 700,000. PRESSURE.—Ordinary, 85 lbs.; fire, 130 lbs. One steam fire engine is used when required. FINANCIAL.—Cost, $126,020. Bonded debt, $75,000, at 5%. Expenses: Operating and taxes, $6,028. Revenue, City, fire protection, $5,690; other purposes, $6,629. MANAGEMENT.—Prest., Geo. H. Ely; Secy. and Supt., Geo. E. Crisp; Treas., Jos. H. Berry; Ch. Pump. Engr., Geo. L. Weller. Rept. by Supt., July 20, '96. Feb. 7, '97, Chas. W. McCorkle, Detroit, rept. he had charge of works. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 27, '82.

PROJECTED MUNICIPAL PLANT.

City voted $250,000 for bonds in '96 and proposed to build works with supply from Lake Erie, 8 miles distant. Dec., '96, Co. took steps in courts to prevent city building works. W.-W. Trustee, Wm. Heldmyer; Cy. Engr., C. H. Snow.

49. **EVANSTON,** Franklin Co. (Not given.) Built in '95 at expense of village by city of Cincinnati; put in operation May 27. Engr., Chas. A. Ewing, Cincinnati. Contrs., Van Sandt & Meeds. SUPPLY.—Cincinnati works. DISTRIBUTION.—Mains, 3½ miles of 6-in. Hydrants, public, 26. FINANCIAL.—Bonded debt, $11,000. MANAGEMENT.—Cincinnati Water Dept. Rept. by Chas. A. Ewing, June 24, '96. SEWERS.—Has sanitary sewers only.

109. **FAIRPORT** (P. O. Fairport Harbor), Lake Co. (1,171.) Supply from Painesville.

50. **FINDLAY,** Hancock Co. (18,553.) Built in '88-9 by city. SUPPLY.—Blanchard River, pumping direct. PUMPS.—Cap., 5,000,000 galls.; 2—2,500,000 Dunn-Gordon-Maxwell comp. dup. Bituminous lump coal used; av. cost, $1.88 per short ton delivered. FILTERS.—Sand and charcoal (galleries previously rept.). RESERVOIR.—Cap., 86,000,000 galls.; impounding, formed by masonry dam on stream. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 26 miles; cost extensions met by funds of

board. Taps, 963, made by city at $6.50 for ¾-in. on 50-ft. street, which is rebated in water. Services, galv. i. and lead; paid for by property owner. Meters: 114; owned, controlled and repaired by city; yearly rental, 25 cts. to $1. City can compel use of meters and any consumer may have one. Hydrants, public, 201; private, 7. CONSUMPTION.—(Galls.) av., 942,734; max., 1,902,336; min., 350,784. PRESSURE.—Ordinary, 65 to 100 lbs; fire, 120 lbs. Steam fire engines are sometimes used on outskirts of city. FINANCIAL.—Cost (in '90), about $275,000. Bonded debt, $338,500; $75,000 at 6%; due '97, 1902 and '07; $88,500, at 6%; due 1922; $225,000, at 5%; due 1908, '14, '19 and '21. Expenses: Operating, $8,299; int., $18,060. Revenue, consumers, $13,658. Int. on bonds paid by city. MANAGEMENT.—Prest., Cloyd Marvin; Secy., Edson E. Marvin; Treas., John Parker; Ch. Pump. Engr., A. R. Dickerson. Rept. by Secy., July 20, '96. SEWERS.—Has partial systems of sanitary and storm sewers.

51. **FOSTORIA,** Seneca and Hancock Cos. (7,070.) Built in '90-1 by city; put in operation Oct., '92. Engr., J. M. Howells, Hamilton. SUPPLY.—Creek, pumping from storage reservoir to tank. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Gordon. Domestic bituminous lump coal used; av. cost, $2.05 per short ton. FILTERS.—Cap., 500,000 galls.; sand and gravel. RESERVOIR.—Cap., 150,000,000 galls. TANK.—Cap., 380,000 galls.; 20 × 100 ft., on stone tower 65 ft. high. DISTRIBUTION.—Mains, 17½ miles; cost extensions met by receipts. Taps, 550; made by city, including service of galv. i., for $6.50; of lead, $10. Services, galv. i.; paid for by property owner. Meters: 65; owned and repaired by consumer; controlled by city. Use of meters optional with consumer; compulsory for large consumers and motors. Hydrants, public, 141; private, 10. CONSUMPTION.—(Galls.) av., 550,000; max., 750,000; min., 450,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $221,900. Bonded debt (in '91), $200,000, at 5%. Expenses: Operating, $6,223. Revenue: Consumers, $9,809. MANAGEMENT.—Prest., J. T. Hale; Secy., C. W. Mickey; Supt., Jno. A. Bradner; Ch. Pump. Engr., W. H. Stewart. SEWERS.—Has sanitary and storm sewers.

52. **FRANKLIN,** Warren Co. (2,729.) Built in '87-8 by town. SUPPLY.—Driven wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Holly hor. dup. DISTRIBUTION.—Mains, 6.5 miles. Taps, 375. Services, lead. Meters: 18. Hydrants, public, 65. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $46,500. Bonded debt, $40,000, at 5%. Expenses, $5,331: Operating, $3,254; int., $2,077. Revenue: Consumers, $2,843. MANAGEMENT.—Prest., M. W. Earhart; Secy., B. P. Blair. Rept. by W. W. Whiting, Corpor. Clk., Oct. 1, '96. SEWERS.—Partially sewered.

53. **FREMONT,** Sandusky Co. (7,141.) Built in '82-3 by city. SUPPLY.—Sandusky River, pumping from gravel beds. PUMPS.—Cap., 4,000,000 galls.; 1—3,000,000 Knowles comp. cond. and 1—1,000,000 high pressure. Bituminous coal used; av. cost, $2.25 per short ton. RESERVOIR.—Cap., 2,000,000 galls.; storage, located near river and pumping station. STAND-PIPE.—Cap., 365,000 galls.; steel; 25 × 100 ft. FISCAL YEAR CLOSED May 11. DISTRIBUTION.—Mains, 13½ miles. Taps, 715; made by city. Services, galv. i.; paid for by property owner. Meters: 3; owned and controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 131. CONSUMPTION.—(Galls.) av., 131,634. PRESSURE.—Ordinary, 40 to 60 lbs.; fire, 95 lbs. FINANCIAL.—Cost, $160,494. Bonded debt, $86,000, at 5%. Expenses: Operating, $8,209. Revenue: Consumers, $9,201; City, none. Deficits are met by general taxation. MANAGEMENT.—Prest., Supt. and Ch. Pump. Engr., C. F. Reiff. Rept. by Secy., J. Schwartz, Sept. 25, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 7, '85.

54. **GALION,** Crawford Co. (6,326.) Built in '82-4 by Galion Water-Works Co. FRANCHISE.—30 yrs. from '85. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service; 10-yrs. contract from '95. No legal difficulties. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap.,3,000,000 galls.; 2—1,500,000 Deane. Hocking Valley bituminous coal used; av. cost, $1.75 per short ton. STAND-PIPE.—Cap., 80,000 galls.; iron; 6 × 140 ft. DISTRIBUTION.—Mains, 11 miles. Taps, 300. Services, galv. i. Meters: 26; owned, controlled and repaired by Co. Hydrants, public, 100. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 lbs. FINANCIAL.—(In '87.) Cost, $100,000. Cap. Stock, $160,000. Bonded debt, $70,000, at 6%. Expenses, $7,200: Operating, $3,000; int., $4,200. Revenue, $8,000: Consumers, $3,000; City, $5,000. MANAGEMENT.—Prest., O. L. Hays; Secy., A. F. Lowe; Treas., F. J. Snyder; Supt., M. G. Chapman. Rept. by Secy., Aug. 8, '96. SEWERS.—Partially sewered.

55. **GALLIPOLIS,** Gallia Co. (4,498.) Built in '95 by city; put in operation Sept. 16, '95. Engr., Samuel M. Gray, Providence, R. I. SUPPLY.—Filter wells on island in Ohio River, by pumping. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Laidlaw-Dunn-Gordon. Kanawha bituminous pea and slack used. FILTER WELLS.—Cap., 720,000 galls. RESERVOIR.—Cap., 2,200,000 galls. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 8 miles. Taps, 380; made by city. Services, galv. i.; paid for by city. Meters: 82; owned, controlled and repaired by city; yearly rental, $1 to $1.50. Use of meters optional with consumer. Hydrants, public, 48. PRESSURE.—Ordinary, 105 lbs. FINANCIAL.—Cost, $85,000. Floating debt, $2,000, at 6%; Bonded,

$85,000, at 5%. Sinking Fund, none. Expenses: Operating, $2,800; int., $4,250. Revenue: Consumers, unmetered, $2,500; metered, $500. MANAGEMENT.—Prest., James Mullineaux; Secy., A. J. Stormont; Supt. Jno. C. Oliver; Ch. Pump Engr., J. D. Oliver. Rept. by Secy., June 15, '96. PROJECTED IMPROVEMENTS.—Extensions to cost about $3,000. SEWERS.—None.

P 3. **GENEVA,** Ashtabula Co. (2,194.) Plans for works to be made and surveys in progress. Engr., Paul Voorhees, Buffalo. Supply, pumping to stand-pipe. Rept. by Engr., Jan. 6, '97.

56. **GLENDALE,** Hamilton Co. (1,444.) Built in '92 by village. Engr., John B. Porter. SUPPLY.—Driven wells, in deep gravel and sand, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon. Bituminous coal used; av. cost, $2 per short ton, delivered at works. STAND-PIPE.—Cap., 105,000 galls.; iron; 15 × 80 ft. DISTRIBUTION.—Mains, 6 miles; cost extensions met by revenue. Taps made by village. Services, lead; paid for by property owner. Meters: a few. Use of meters compulsory for R. R., college, etc. Any consumer may have a meter. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Bonded debt, $35,000, at 4%. Expenses: Operating, $3,500. MANAGEMENT.—Prest., Benj. Bartlett; Secy. and Treas., Robt. Hargett. Rept. by Florien Gianque, Mem. Bd. Trus., Aug. 31, '96. SEWERS.—Partial system of sanitary and storm sewers.

80. **GLENVILLE,** Cuyahoga Co. (Est., 801.) Supply from Cleveland.

57. **GRANVILLE,** Licking Co. (1,366.) Built in '85 by town. SUPPLY.—Driven wells, pumping to tanks. PUMP.—Cap., 180,000 galls.; Knowles comp. dup. TANK.—Cap., 95,000 galls.; 20 × 30 ft. DISTRIBUTION.—Mains, 5.5 miles. Taps, 144. Meters, 8. Hydrants, 37. FINANCIAL.—Cost, $18,000. Debt, $9,000, at 6%. Expenses: Operating, $900; int., $450. Revenue: Consumers, $1,008. NOTE.—No rept. since '90-1 Manual.

58. **GREENFIELD,** Highland Co. (2,460.) Built in '91 by city; put in operation July 10. SUPPLY.—Paint Creek, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; Gordon. STAND-PIPE.—Cap., 85,000 galls.; 14 × 75 ft. DISTRIBUTION.—Mains, 6 miles. Hydrants, 57. FINANCIAL.—Cost, $40,000. Int., 5%. NOTE.—No rept. since '90-1 Manual.

59. **GREENVILLE,** Darke Co. (5,473.) Built in '93 by city; put in operation Nov. 18. Engr., J. W. Hill, Cincinnati. SUPPLY.—Nine 6-in. driven wells, with connection to creek, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Hughes comp. cond. dup. Natural gas used; av. cost, $600 per year. STAND-PIPE.—Cap., 146,000 galls.; 20 × 60 ft., on brick tower 70 ft. high. FISCAL YEAR CLOSED July 31. DISTRIBUTION.—Mains, 11.6 miles; cost extensions met by city. Taps, 404; made by city free, including service to curb. Services, lead; paid for by consumer from curb. Meters: 99; owner and repaired by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 106; private, 1. CONSUMPTION.—(Galls.), av. 70,000; max., 300,000; min., 50,000. PRESSURE.—Ordinary, 58 lbs.; fire, 100 lbs. (direct pressure). Two steam fire engines are used. FINANCIAL.—Cost, $85,421. Bonded debt: Press rept., Jan. '93, stated $75,000 bonds had been sold. Revenue, $2,426. Deficits of $2,000 met by taxation. MANAGEMENT.—Prest., J. C. Weaver; Secy., B. D. Lecklider; Cy. Treas., O. F. Davidson; Supt. Jno. P. Lucas; Ch. Pump. Engr., F. C. Boyer. Rept. by Supt., June 25, '96. SEWERS.—None. REFERENCE.—Water tower, Eng. News, June 7, '94, illus.

60. **GREENWICH,** Huron Co. (881.) Built in '96 by village; put in operation in Nov. Engr., Burton J. Ashley, Chicago. SUPPLY.—Well, 24 × 20 ft., pumping to stand-pipe. PUMP.—Cap., 750,000 galls.; McGowan comp. dup. STAND-PIPE.—Cap., 72,000 galls.; steel: 11 × 100 ft. DISTRIBUTION. Mains, 2.3 miles. Services, lead, Meters, 0. Hydrants, public, 20. PRESSURE.—Ordinary, 43 lbs.; fire, 75 to 100 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $12,000, at 6%. Sinking Fund: $762, not invested. MANAGEMENT.—Trustees, C. A. McCullow and others. Rept. by C. A. McCullow, Clk., Oct. 15, '96. SEWERS.—Has storm sewers only.

61. **HAMILTON,** Butler Co. (17,565.) Built in '84 by city. SUPPLY.—Wells, pumping to reservoir and direct. PUMPS.—Cap., 3,000,000 galls; Gordon. Jackson bituminous mine run coal used; av. cost, $1.63 per short ton. RESERVOIRS.—Cap., 7,000,000 galls.; 248.85 ft. above low water in Miami River. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 38 miles; cost extensions met by revenue. Taps, 2,800; made by city at $12 for 1-in., $10 for ¾-in., $8 for ⅝-in. and $6 for ½-in. Services, lead; paid for by city. Meters: 300; owned by city or consumer; controlled and repaired by city; yearly rental, $3 for ⅝-in. City can compel use of meters and any consumer may have one. Hydrants, public, 360; private, 50. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $400,000. (Balance of financial is for yr. ending June 1, '94.) Bonded debt, $330,000, at 5%, due $10,000 per yr. to and including 1907, then $20,000 per yr. to and including 1914, and $10,000 in 1915. Expenses, operating, $25,201. Revenue, $24,211: Consumers, unmetered, $14,485; metered, $9,726. MANAGEMENT.—Prest., Jos. H. Long; Ch. Pump. Engr., Chris. Eberling. Rept. by Secy., Jno. Fisher, in '96; and from annual rept. for '93-4, as to part of financial. SEWERS.—Has sanitary and storm sewers.

62. **HARRISON,** Hamilton Co. (1,690.) Built in '91 by Harrison Water, Light & Power Co.; owned by A. M. Miller; put in operation May 23. FRANCHISE.—20 yrs. from '91; does not provide for purchase of works by city. Co. is not exempt from local taxes. Court decided (not stated what) in favor of Co., July, '95. SUPPLY.—White-water River and wells, pumping to stand-pipe and direct. PUMPS.—Cap., 500,000 galls.; 2—250,000 Gordon pumps. Bituminous run of mine coal used. STAND-PIPE.—Cap., 100,000 galls.; steel: 12 × 100 ft. FISCAL YEAR CLOSED Jan., '96. DISTRIBUTION.—Taps, 200; made by consumer. Services, lead; paid for by consumer. Meters: 20; owned and repaired by consumer; controlled by Co. Use of meters compulsory for hotels, livery stables and factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 33; private, 1. CONSUMPTION.—(Galls.) av., 70,000. PRESSURE.—Ordinary, 45 lbs.; fire, 140 lbs. One steam fire engine is owned by city but seldom used. FINANCIAL.—Cost (in '91), $54,284. Bonded debt, none. Expenses: Operating, $4,000. Revenue: City, fire protection, $1,800; street sprinkling, $200; other purposes, $700. MANAGEMENT.—Rept. by Secy. and Supt., Jas. A. Graft, July 10, '96. SEWERS.—None.

63. **HARTWELL,** Hamilton Co. (1,507.) Built in '93 by village; put in operation Sept., '93. Engr., Harry Ennis. SUPPLY.—Driven wells, pumping to reservoir. DISTRIBUTION.—Mains, 29 (?) miles; cost extensions met by water-works fund. Taps, 130; made by city. Services, lead; paid for by consumer at 50 cts. per ft. Meters: 2, owned by consumer; compulsory for gardens. Village can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 0. PRESSURE.—Ordinary and fire, 125 lbs. MANAGEMENT.—Prest., Chas. W. Lucius; Secy., H. B. Clutes; Treas., H. D. Blackburn; Supt., Jno. Corey; Ch. Pump. Engr., C. F. Gates. Rept. by Secy., Sept. 3, '96. SEWERS.—Has storm sewers.

64. **HICKSVILLE,** Defiance Co. (2,141.) Built in '90 by village; put in operation Nov. 18. SUPPLY.—Six wells, pumping direct. PUMPS.—Cap., 700,000 galls.; Hughes. Columbus Coal Co. bituminous coal used; av. cost, $2.80 per short ton. RESERVOIR.—Cap., 500,000 galls.; storage. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by tax levy and surplus from maintenance fund. Taps, 208; made by village for $5. Services, galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 36; private, 1. CONSUMPTION.—(Galls.) av., 200,000; max., 275,000; min., 125,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $23,500. Bonded debt, $20,000, at 6%. Sinking Fund: $900. Expenses: Operating, $1,241. Revenue: Street sprinkling, $50. Works are self-sustaining. MANAGEMENT.—Prest., J. L. Berrington; Secy. and Supt., Jno. Berger; Treas., E. C. Culler; Ch. Pump. Engr., H. Clarke. Rept. by Supt., July 9, '96.

65. **HILLSBORO,** Highland Co. (3,620.) Built in '93 by city. Des. Engr., Edw. Fladd, St. Louis. Contrs., Boughen Engrg. Co. SUPPLY.—12 driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 (makers rept. 2,000,000) galls.; Laidlaw-Dunn-Gordon comp. dup. Thacker bituminous coal used; av. cost, 9 cents per bushel. STAND-PIPE.—Cap., 178,000 galls.; 15 × 135 ft. FISCAL YEAR CLOSED May, '96. DISTRIBUTION.—Mains, 10.5 miles; cost extensions met by taxation. Taps, 389; made by city; charge $3 for permit. Services, iron and lead; paid for by city to curb line. Meters: 43; owned by consumer; controlled and repaired by city. Co. can compel use of meters and any consumer may have one. Hydrants, public, 72; private, 6. CONSUMPTION.—(Galls.) av., 125,000; min., 50,000. PRESSURE.—Ordinary, 40-52 lbs. Steam fire engines are used. FINANCIAL.—Cost, $84,000. Bonded debt, $85,000. Revenue paid operating expenses last year. A deficit would be met by taxation. MANAGEMENT.—Prest., Jno. Weingardner. Rept. by Secy. and Supt., S. D. Amen, Sept. 1, '96.

P 4. **HIRAM,** Portage Co. (Est., 368.) Bids for works were to have been received by village Apr. 8, '97, including 25 × 8-ft. collecting well; 140,000-gall. pump and gasoline engine; 12 × 60 ft. steel stand-pipe; 2½ miles mains and 27 hydrants. Bids were also to be received until Mar. 30 for $12,000 of 6% bonds, payable $500 yearly, beginning Apr. 1, '94. Clk. and W.-W. Trustee, B. S. Dean. Engr., E. C. Cooke, Cleveland.

66. **IRONTON,** Lawrence Co. (10,939.) Built in '70-1 by city. SUPPLY.—Ohio River, pumping direct (previously rept. as pumping to 160,000-gall. tank, 40 × 18 ft.). PUMPS.—Cap., 2,400,000 galls.; 2—1,200,000 McGowan double acting. Av. cost of coal, $4 per short ton. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 16.5 miles; cost extensions met by revenue. Taps, 1,600; made by city for $5.25. Services, iron and lead; paid for by consumer. Meters, 0. City is thinking of introducing some meters for large consumers. Hydrants, public, 186; private, 0. CONSUMPTION.—(Galls.) av., 1,100,000; max., 1,300,000; min., 1,000,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $189,000. Bonded debt, $150,000. Sinking Fund, none. Expenses (in '90), $14,276. Revenue (in '90): Consumers, $13,644. Int. paid by general taxation. MANAGEMENT.—Prest., Geo. A. Meyers; Secy., Joe Lloyd; Supt., F. L. Barker; Ch. Pump. Engr., F. E. Brammer. Rept. by Secy., June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 17, '81.

67. **KENT,** Portage Co. (3,501.) Built in '86-7 by Kent Water Co.; consolidated with the electric light plant in '90 and now called the Kent Water & Light Co. FRAN-

CHISE.—20 yrs. from '85. City to pay $50 per hydrant per yr. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Holly hor. dup. Bituminous coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 126,720 galls.; iron; 14 × 110 ft.; top 200 ft. above pumping station. DISTRIBUTION.—Mains, 8.5 miles. Taps, 375; made by Co. for $3. Services, w. i. and lead; paid for by consumer or owner. Meters: 5; owned, controlled and repairs paid by Co. Co. cannot compel but may prohibit use of meters. Hydrants, public, 79. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary, 100 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $200,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $105,000, at 6%; due 1909. Expenses: Operating, $5,400; taxes, $330. Revenue: Consumers, $5,200; City, fire protection, $3,950. MANAGEMENT.—Prest., C. C. Pomeroy; Secy. and Treas., C. E. Kimball, both of New York; Supt., A. B. Young; Ch. Pump. Engr., F. C. Green. Rept. by H. H. Bowby, 45 Wall St., New York, June 24, '96. SEWERS.—None.

68. **KENTON,** Hardin Co. (5,557.) Owned by city; built in '81-2 by Co. SUPPLY.—Well, 20 × 24 ft., pumping direct. Press rept., June, '92, stated contract for drilling wells had just been let; another, Sept., '94, stated work was in progress for nearly doubling cap. of reservoir. PUMPS.—Cap., 2,500,000 galls.; Holly; 1,500,000 quadruplex; 1,000,000 hor. dup. DISTRIBUTION.—Mains, 7 miles. Taps, 400. Meters: 5. Hydrants, 73. FINANCIAL.—Cost, $83,000. Bonded debt, $60,000, at 6%. Sinking Fund: $30,000. Expenses, $7,400: Operating, $3,800; int., $3,600. Revenue, $4,400: Consumers, $4,000; county, $400. NOTE.—No rept. since '90-1 Manual. SEWERS.—Has sewers. REFERENCE.—Eng. News, Jan. 13, '83.

80. **LAKEWOOD,** Cuyahoga Co. (Not given.) Supply from Cleveland (through pipes owned by village?).

69. **LANCASTER,** Fairfield Co. (7,555.) Built in '80-2 by town. In '77 fire protection plant was built. SUPPLY.—Gallery and well, pumping to tank. In '89 gallery was rept. as 4 ft. wide, 4½ ft. high, 270 ft. or more long, connecting with 18 × 20-ft. well. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington simple high pressure. Natural gas used. STAND-PIPE.—Cap., 131,376 galls.; iron; 18 × 69 ft. on stone foundation. FISCAL YEAR CLOSED Mar. 20. DISTRIBUTION.—Mains, 9.3 miles; cost extensions met by surplus earnings. Taps made by consumer at $5 for ½-in. to $10 for 1-in. Services, lead; paid for by city. Meters: 10; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city; compulsory for hotels and livery stables. Hydrants, public, 86. CONSUMPTION.—(Galls.) av., 256,180; max., 455,000; min., 168,000. PRESSURE.—Ordinary, 56 lbs.; fire, 110 lbs. Steam fire engines are used. FINANCIAL.—Cost, $69,380. Bonded debt, $5,000, at 6%. Expenses: Operating, $2,262. Revenue: Consumers, $4,342. MANAGEMENT.—Prest., J. B. Orman; Secy. and Supt., Louis J. Snyder; Treas., A. J. Musser; Ch. Pump. Engr., Ira Tripp. Rept. by Supt., June 3, '96. SEWERS.—Has partial system of sanitary and storm sewers. REFERENCE.—Eng. News, June 24, '82.

70. **LEBANON,** Warren Co. (3,050.) Built in '96 by village; put in operation in June. Engr., J. W. Hill, Cincinnati. SUPPLY.—Four 6-in. drilled wells, flowing into pump well, 40 × 25 ft., pumping to stand-pipe. PUMPS.—Cap., 750,000 or 1,500,000 galls.; two comp. cond. dup. Jackson bituminous coal used. STAND-PIPE.—Cap., 293,700 galls.; 25 × 80 ft., on stone foundation about 3 ft. above ground level. DISTRIBUTION.—Taps, 120; made by village; consumer pays $3 for permit. Services, galv. i.; paid for by owner. Meters: 5; owned by property owner; controlled by village. Use of meters optional with consumer. Hydrants, public, 79; private, 2. PRESSURE.—Ordinary, 70 lbs.; fire, 140 lbs. Village owns steam fire engine. FINANCIAL.—Cost, $52,000. Bonded debt, $50,000, at 5%. MANAGEMENT.—Prest., Frank A. Bone; Clk., E. B. Pauly; Treas., C. E. Eulas; Supt. and Ch. Pump. Engr., Milt. Marfort. Rept. by Prest., Sept. 1, '96. SEWERS.—None.

71. **LEETONIA,** Columbiana Co. (2,826.) Built in '89 by village; put in operation Oct., '90. SUPPLY.—Springs, by gravity to collecting basin and to supply reservoir at pumps, thence by direct pumping, surplus going to small storage reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon comp. dup. Bituminous run of mine coal used; av. cost, $1.65 per short ton delivered. RESERVOIRS.—Cap., 600,000 galls.; storage, 500,000, 185 ft. above city, and collecting, 100,000, at pumping station. FISCAL YEAR CLOSED Mar. 20. DISTRIBUTION.—Mains, 7.6 miles; cost extensions met by general fund. Taps, 335; made by city. Services, lead and iron; paid for by property owner. Meters: 6; owned, controlled and repaired by city; yearly rental, $5 to $20. Use of meters optional with city; compulsory for manufacturers. Hydrants, public, 67; private, 1. CONSUMPTION.—(Galls.) av., 97,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $49,627. Bonded debt, $36,000, at 5%. Sinking Fund, $1,233. Expenses: Operating, $2,667. Revenue, $3,716. MANAGEMENT.—Prest., S. E. Stambaugh; Secy. and Supt., W. H. Freed; Ch. Pump. Engr., Alex. McNickel. Rept. by Supt., July 13, '96. PROJECTED IMPROVEMENTS.—Drilled wells. SEWERS.—None.

72. **LIMA,** Allen Co. (15,981.) Built in '85-7 by city. SUPPLY.—Surface and deep wells, pumping to reservoir. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Holly-Gaskill hor. high duty. Gas used as fuel. RESERVOIRS.—Impounding: Area, 6 acres;

depth, 8½ ft. Distributing: Area, 21 acres. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 35 miles; cost extensions met by revenue. Taps, 2,300; made by city. Services, lead and iron; paid for by city to curb. Meters: 60; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for all large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 215. CONSUMPTION.—(Galls.), av., 1,076,814. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs.(Steam fire engines are used in outskirts of city. FINANCIAL.—Cost, $320,000. Bonded debt, $338,000, at 5%. Sinking Fund, none. Expenses: Operating, $11,500; int., $8,500. Revenue, $26,737. One-half int. paid by general taxation. MANAGEMENT.—Prest., M. C. Craig; Secy. and Supt., H. B. Hackedorn; Ch. Pump. Engr., Ed. King. Rept. by Supt., July, '96. SEWERS.—Has sanitary and storm sewers.

28. **LINWOOD,** Hamilton Co. Now part of Cincinnati, which see.

73. **LISBON,** Columbiana Co. (Est., 3,000.) Built by village more than 50 yrs. ago. SUPPLY.—Creek, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; one Worthington comp. non-cond. RESERVOIRS.—50 × 50 × 20 ft. DISTRIBUTION.—Mains, 5 miles; 10 to 4-in. iron. Taps, 300. Meters: 8. Hydrants, 70. CONSUMPTON.—(Galls.) av., 150,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, unknown. No debt. Expenses: Operating, $1,500. Revenue: Consumers, unmetered, $2,500. MANAGEMENT.—Village officers: Prest., R. G. Eells; Secy., A. A. Ramsey; Treas., M. J. Child. Rept. by Secy., Feb. 18, '97. SEWERS.—Has small sewerage system.

74. **LOCKLAND,** Hamilton Co. (2,474.) Distribution system built in '94 by village. Contr., D. R. P. Dimmick, Newport. SUPPLY.—Reading works, through meter. DISTRIBUTION.—Mains, 8 miles. Hydrants, 40. FINANCIAL.—Contract price, $19,585. MANAGEMENT.—Mayor, G. W. Davis. Information from press repts., except statement that "village buys water from Reading," made by Mayor, Dec. 17, '96.

75. **LOGAN,** Hocking Co. (3,119.) Built in '96 by city; put in operation Apr. 1. Engr., Frank Snyder, Columbus. SUPPLY.—Well, 25 × 28 ft., 12 ft. of water, pumping direct. PUMP.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-comp. Screened lump bituminous coal used; av. cost, $1.50 per short ton delivered. DISTRIBUTION.—Mains, 3.2 miles; cost extensions met by receipts. Taps, 55; made by city for $5.75, ½-in.; $6.75, ¾-in. and ¾-in.; $8, 1-in.; $12.00, 2-in. Services, galv. i.; paid for by consumer to curb. Meters, 0. Use of meters optional with consumer. City can compel use of meters for all steam and special uses and reserves the right to put on meter when consumer misrepresents the amount consumed. Hydrants, public, 72. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $36,400. Bonded debt, $35,000, at 5%, due 1900 and thereafter at $1,200 per yr. Revenue: Consumers, unmetered, $700. MANAGEMENT.—Prest., Chas. Wright; Secy. and Supt., T. W. Rochester; Ch. Pump. Engr., Henry Lutz. Rept. by Secy., June 16, '96. PROJECTED IMPROVEMENTS.—A 1,000,000-gall. reservoir. SEWERS.—Has sanitary and storm sewers.

76. **LONDON,** Madison Co. (3,313.) Built in '89-90 by London Water Co. SUPPLY.—Three 6-in. and two 8-in. wells, pumping direct and to stand-pipe; cap. of wells, 800,000 galls.; four of the wells flow. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon; one comp. and one high pressure. STAND-PIPE.—Cap., 293,000 galls.; 20 × 125 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 12 miles. Taps, 400. Meters, 250. Hydrants, public, 118. FINANCIAL.—Cost, $120,000. Expenses, $3,000. MANAGEMENT.—Prest., Harvey Myers, Covington, Ky. Rept. by Secy., Treas. and Supt., Frank C. Smith, Washington C. H., Oct. 20, '96. SEWERS.—Some.

77. **LORAIN,** Lorain Co. (4,863.) Built in '84 by town. SUPPLY.—Lake Erie, pumping direct. Intake, 1,700 ft. of 24-in. pipe, ending in 10 × 16-ft. well. PUMPS.—Cap., 8,000,000 galls.; 1,000,000 Walker; 2,000,000 Gordon & Maxwell; 5,000,000 Holly-Gaskill hor. high duty (was being erected Dec. 30, '96). Bituminous slack used; av. cost, $1.25 per short ton. FILTERS.—Cap., 3,000,000 galls.; Jewell, built in '96. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 26 miles; cost extensions met by bonds. Taps, 2,482; made by city for $1. Services, lead; paid for by consumer. Meters: 48; owned, controlled and repaired by city. Use of meters optional with city; compulsory for large consumers. Hydrants, public, 157. CONSUMPTION.—(Galls.), av. 1,500,000. PRESSURE.—Ordinary, 65 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $130,000. Expenses: Operating, $5,390; int., at 5%. Revenue: Consumers, unmetered, $12,500; street sprinkling, $20; other purposes, $3,000. MANAGEMENT.—Prest., H. J. Barrows. Rept. by Secy. and Supt., F. C. Norcross, June 4, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Jewell filters, Eng. News, May 28, '96.

78. **LOUISVILLE,** Stark Co. (1,328.) Built in '95 by city; put in operation Feb. 10. Engr., L. E. Chapin, Canton; Contrs., Louisville Steam Pump Co. SUPPLY.—Two wells, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Volsard. Bituminous slack used; av. cost, 85 cts. per short ton. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. FISCAL YEAR CLOSED April, '96. DISTRIBUTION.—Mains, 8 miles; cost extensions met by town. Taps made by Town Engr. for $5. Services, galv. i.; paid for by town to curb. Town can compel use of meters and any consumer may have one. Hydrants, public, 28; private, 4. CONSUMPTION.—"Unknown.". PRESSURE.—Ordinary, 43 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $15,000. Expenses, Operating, $1,200. Revenue: Consumers, unmetered, $300; street sprinkling, $600; public

buildings, $100. MANAGEMENT.—Prest., Henry C. Kropf; Secy., Henry McCamman; Treas., Adam Metzger; Supt. and Ch. Pump. Engr., Cissero Clapper. Rept. by Secy., Dec. 29, '96. SEWERS.—None.

79. **LYNCHBURG,** Highland Co. (763.) Built in '96 by city; put in operation in Sept. Engr., E. F. Layman, Cincinnati. SUPPLY.—Dug well, pumping to tank. Well, 16 × 20 ft., into water bearing gravel 6 ft. thick, overlying solid rock. PUMP.—Cap., 250,000 galls.; Laidlaw-Dunn-Gordon dup. Bituminous coal used; av. cost, $2.25 per short ton. TANK.—Cap., 40,000 galls.; steel, 16 × 20 ft., on steel trestle 98 ft. high. FISCAL YEAR NOT CLOSED. DISTRIBUTION.—Mains, 3.8 miles; cost extensions met by city. Taps, 20; made by city, free. Services, lead; paid for by city. Meters, 0. City can compel use of meters. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 4,000. Will be used chiefly for fire protection. PRESSURE.—Ordinary, 45 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $16,000, including electric light plant. MANAGEMENT.—Trustees; Chn., Dr. T. F. Scott; Ch. Pump. Engr., Wm. Haworth. Rept. by E. F. Layman, Jan. 1, '97. SEWERS.—None.

80. **MADISONVILLE,** Hamilton Co. (2,214.) Built in '92 by village; put in operation Oct. 15. Engr., J. Haller. Water and electric light plants operated together. SUPPLY.—Drilled wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon comp. dup.; also three deep well pumps. Va. bituminous coal used; cost, $1.85 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by bonds. Taps, 150; made by village. Services, lead; paid for by consumer at 55 cents per ft.; plumber receives 44 cents per ft. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 76. CONSUMPTION.—(Galls.) av., 55,000. Very little water is used in winter. PRESSURE.—Ordinary, 70 lbs.; fire, 140 lbs. FINANCIAL.—Bonded debt, $35,000 (?): $15,000, at 4½; $15,000, at 5%; all due 1922; also $10,000 combined water and light bonds, due 1924. Expenses, $2,976, including $277 for service connections. Revenue, $3,296: Consumers, $1,438; service connections, $372; City, $1,486. Deficits are met by tax levy of 1½ mills on the dollar. MANAGEMENT.—Prest., C. T. Pierce; Vill. Clk., Bennett Carter; Vill. Treas., C. W. Bailey. Rept. by Supt., T. C. Finch, June 22, '96 SEWERS.—Partial system of sanitary sewers.

81. **MANSFIELD,** Richland Co. (13,473.) Built in '70-2 by city. SUPPLY.—Wells, flowing to receiving reservoir at pumping station, thence pumping direct. PUMPS.—Cap., 6,000,000 galls.; 2,000,000 and 4,000,000 Gordon (rept. by makers). Cambridge bituminous coal used; av. cost, $1.55 per short ton. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 45 miles; cost extensions met by rentals. Taps, 1,625; made by city for $6.25. Services, galv. i.; paid for by consumer. Meters: 25; owned by consumer; controlled and repaired by city. Use of meters compulsory for manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 190; private, 4. CONSUMPTION.—(Galls.) av., 1,250,000. PRESSURE.—Ordinary, 115 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $333,710. Bonded debt (Mar. 1, '94), $53,500: $3,500 at 6%, due in '94; $50,000 at 5%, due July 1, '95 to 1904, inclusive. Expenses, Operating, $9,131. Revenue, $19,158: Consumers, unmetered, $18,261; metered, $600; street sprinkling, $100; sewer flushing, $100; other purposes, $198. MANAGEMENT.—Prest., W. W. Stark; Secy. and Supt., S. C. Clark; Treas., County Treas.; Ch. Pump. Engr., Lawrence Cone. Rept. by Supt., July 8, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 28, '82.

82. **MARICE CITY** (P. O. Continental), Putnam Co. (895.) Built in '94 by village. Engr., G. W. Bassett, Continental. SUPPLY.—Two wells, pumping to tank. PUMP.—Cap., 47,000 galls. Coal used; av. cost, $3.25 per short ton. TANK.—Cap., 15,000 galls.; on building 20 ft. high. DISTRIBUTION.—Mains, 1.5 miles; cost extensions met by taxes. Taps, 75; made by village. Services, ¾-in.; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $4,000. Bonded debt, $3,500, due $500 yearly. No deficits. MANAGEMENT.—Prest., A. E. Lowden; Secy., C. M. Goheen; Treas., J. E. Robinson; Supt., Jas. Bell. Rept. by Ch. Pump. Engr., Geo. W. Bussert, Dec. 19, '96. SEWERS.—Has sanitary and storm sewers.

83. **MARIETTA,** Washington Co. (8,273.) Built in '89-90 by city; put in operation Sept., '91. SUPPLY.—Ohio River, pumping direct to settling tanks, by gravity to city. PUMPS.—Cap., 2,000,000 galls.: 2—1,000,000 Gordon comp. dup. Natural gas used. STAND-PIPES.—Two: cap., 698,000 galls.; steel; 30 × 66 ft. FISCAL YEAR CLOSED May. DISTRIBUTION.—Mains, 20 miles; cost extensions met by rentals. Taps, 1,000; made by city for $1. Services, lead to curb, remainder iron; paid for by consumer. Meters, 5; owned and repaired by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 163; private, 2. CONSUMPTION.—(Galls.) av., 800,000; max., 1,000,000; min., 600,000. PRESSURE.—Ordinary, 70 to 100 lbs., fire, can be increased to 140 lbs. FINANCIAL.—Cost, $125,000. Floating debt, $110,000, at 4½%. Expenses: Operating, $6,780. Revenue: Consumers, unmetered, $12,140. MANAGEMENT.—Prest., T. F. Davis. Rept. by Secy. and Supt., J. B. West, June 4, '96. SEWERS.—Has sanitary and storm sewers.

84. **MARION,** Marion Co. (8,327.) Now owned by Marion Water Co. Built in '89-90 by Scioto Water Co.; put in operation June 12, '90. Press rept. states Co. went into hands of receiver in '94, and that on Feb. 27, '95, works were sold by order of court, bondholders buying (equity?) for $97,000; also that claim against works was $284,864, and that Master Comr. appraised them at $145,000. FRANCHISE.—25 yrs., exclusive, from '90, which provides for purchase of works by city after 10 yrs., and every five yrs. thereafter. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $5,480 for 143 hydrants, additional ones at $30 each. No legal difficulties. SUPPLY.—Gravel beds, 2½ miles west of city and 65 ft. below city datum, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Deane comp. cond. dup. Av. cost of coal used, $2.30 per short ton, delivered in bin. STAND-PIPE.—Cap., 330,480 galls.; iron; 25 × 90 ft., on masonry tower 20 ft. high; 130 ft. above business part of town. FISCAL YEAR CLOSED June. DISTRIBUTION.—Mains, 15 miles; cost extensions met by bonds. Taps, 800; made by Co., free, including service to sidewalk. Services, galv. i.; paid for by Co. Meters, 145; owned and repaired by consumer; controlled by Co. Use of meters compulsory for factories, livery stables, hotels and restaurants. Co. can compel use of meters and any consumer may have one. Hydrants, public, 162; private, 1. CONSUMPTION.—Galls.) av., 450,000; max., 600,000; min., 400,000. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. One steam fire engine is used. FINANCIAL.—Bonded debt (in '90), $200,000, at 6%. City is allowed 2,500,000 galls. free, and pays for excess. MANAGEMENT.—Prest., E. F. Pratt, Boston; Secy. and Treas., C. E. Burke, Cleveland; Ch. Pump. Engr., Wm. Connell. Rept. by Supt., H. C. Stillwell. SEWERS.—Has sanitary and storm sewers.

85. **MARTINS FERRY,** Belmont Co. (6,250.) Built in '86-7 by city. Supplies Bridgeport. SUPPLY.—Ohio River, pumping through distribution to reservoir. PUMPS.—Cap., 3,000,000 galls.; 1,000,000 Hughes comp. dup.; 2,000,000 Gordon-Maxwell comp. dup. Bituminous coal used; av. cost, 81 cts. per short ton. RESERVOIR.—Cap., 2,500,000 galls.; distributing; area, 0.9 acre. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by revenue. Taps, 1,064; made by city for $2. Services, lead; paid for by consumer. Meters, 9; owned and repaired by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 98. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $165,370. Bonded debt, $100,000, at 5%; due 1923; $25,000, at 5%, due 1925; $20,000, at 6%, due '97 to 1906; $4,000, at 5%, due '97 to 1900. Expenses: Operating, $5,921; int., $7,475. Revenue, $18,417. MANAGEMENT.—Prest., J. P. Crowel; Secy., T. E. Pugh; City Treas., David Coss; Supt., Chas. S. Moore; Ch. Pump. Engr., Jos. W. Moore. Rept. by Supt., Nov. 2, '96. SEWERS.—Has partial system of sanitary sewers.

86. **MARYSVILLE,** Union Co. (2,810.) Built in '90-1 by Marysville Light & Water Co.; put in operation Jan. 28, '91. FRANCHISE.—50 yrs. from '91 (previously rept. as 30 yrs.). Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. Water-works plant is operated in connection with electric light plant. Total cost, $119,000. SUPPLY.—Driven wells and dam on Mill Creek, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Hughes. W. Va. bituminous slack used; av. cost, $1.40 per short ton, f. o. b. RESERVOIR.—Cap., 6,000,000 galls.; impounding; formed by masonry dam. DISTRIBUTION.—Mains, 9 miles; cost extensions met by earnings. Taps, 450; made by consumer. Services, lead and iron; paid for by consumer. Meters, 6; controlled by Co.; yearly rental, none. Use of meters optional with Co.; compulsory for R. R. and hotels. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 750,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $87,000; Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $60,000, at 6%. For combined light and water plants: Expenses: Operating, $7,000. Revenue, $20,000. City, fire protection, $3,700; other purposes, $5,000. MANAGEMENT.—Prest. and Supt., Jno. F. Zwerner; Secy., Geo. M. McPeck; Treas., Walter C. Fullington; Ch. Pump. Engr., C. V. Hood. Rept. by Prest., June 6, '96. SEWERS.—Will have sanitary and storm sewers before long.

87. **MASSILLON,** Stark Co. (10,092.) First supplied in '54; present system built in '85-6 by Massillon Water Co., which (press rept.) reorganized in '93 as Massillon Water Supply Co. Press rept. states receiver was appointed in '93, and that works were sold by order of court in Aug., '95, for $77,000. FRANCHISE.—20 yrs. from '87. Rates are subject to regulation by city. SUPPLY.—Artesian wells, by pumping, and Sippo Lake, by gravity; former is used for fire and domestic supply and the latter for railroads, manufacturing purposes and street sprinkling. PUMPS.—Cap., 6,250,000 galls.; 1,000,000 Blake; 1,250,000 Deane comp. dup.; 1,000,000 Worthington non-comp. high pressure. RESERVOIR.—Cap., 30,000,000 galls.; impounding. STAND-PIPE.—Cap., 550,800 galls.; iron; 25 × 150 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 22.75 miles; cost extensions met by revenue. Taps, 1,300; made by Co. at $7 for ½-in.; $8 for ¾-in. and $10 for 1-in., including service to curb. Services, galv. i.; paid for by consumer. Meters, 47; owned, controlled and repaired by Co.; yearly rental, $2. Use of meters compulsory for motors and hydraulic pumps. Co. can compel use of meters and any consumer may have one. Hydrants, public, 254; private, 4. CONSUMPTION.—(Galls.) av., 550,000; max., 1,000,000; min., 300,000. PRESSURE.—Ordinary, 90 lbs.;

fire, 120 lbs. One steam fire engine. FINANCIAL.—Cap. Stock: Authorized, $200,000; paid-up, $194,700. Bonded debt, $193,120, at 5%; Expenses: Operating, $5,803; taxes, $1,648. Revenue: Consumers, $12,909; City, $9,450; street sprinkling, $150. MANAGEMENT.—Prest. & Treas., R. B. Dodson, 2 Wall St., New York. Rept. by Secy. and Supt., A. W. Inman, June 6. '96. SEWERS.—Has sanitary and storm sewers.

F 3, P 5. **MEDINA,** Medina Co. (2,073.) Built by town for fire protection. Press rept., Feb. 12, '97, stated city was offering $8,000 bonds for sale (Feb. 27), proceeds to be used to build works. Rept. from citizen stated deep well pump would lift water to steel stand-pipe and that 1,000 ft. of pipe would be laid; Engr., Burton J. Ashley, Chicago.

88. **MIDDDLETOWN,** Butler Co. (7,681.) Built in '73-4 by town. SUPPLY.—Well, 28 x 33 ft., pumping direct. PUMPS.—Cap., 5,000,000 galls.; 3,000,000 Smith & Vaile, 2,000,000 Holly quadruplex. DISTRIBUTION.—Mains, 12 miles. Hydrants, 85. FINANCIAL.—Cost, $84,500. Bonded debt, $78,500. Expenses, $10,767: Operating, $6,852; int., $3,925. Revenue, $7,234: Consumers, $5,502; from County, $1,732. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 10, '83.

89. **MILAN,** Erie Co. (627.) Built in '88 by village. SUPPLY.—Ground water, gathered in infiltration reservoir, thence by gravity. PUMP.—Cap., 1,000,000 galls.; Hughes. RESERVOIR.—Is 90 x 144 ft. x 20 ft. deep. DISTRIBUTION.—Mains, 28 miles. Taps, 30. Meters, none. Hydrants, 23. FINANCIAL.—Cost, $15,392. Bonded debt, $8,000, at 5%. Expenses, $1,395: Operating, $995; int., $400. Revenue, $147. NOTE.—No rept. since '90-1 Manual.

90. **MILFORD CENTRE,** Union Co. (718.) Built in '95 by city for general supply. SUPPLY.—Springs, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 McGowan dup. high pressure (rept. by makers). FINANCIAL.—Press rept., Mar., '94, stated $12,000 bonds had been voted for water and light. MANAGEMENT.—Rept. by Clk., Ed. Miller, June 13, '96.

91. **MILLERSBURG,** Holmes Co. (1,923.) Built in '96 by village; put in operation Apr. 1. Engr., B. J. Ashley, Opera House Block, Chicago, Ill.; Contrs., Snyder, Williams & Co., Dayton. SUPPLY.—Well, 24 x 20 ft., by pumping. PUMP.—Cap., 500,000 galls.; Smith, Vaile & Co., Dayton. Bituminous coal used; av. cost, $2.25 per short ton. RESERVOIR.—Cap., 155,000 galls.; storage and distributing; brick; elev., 260 ft. DISTRIBUTION.—Taps, 100; made by village for $5. Services, iron; paid for by village. Meters owned, controlled and repaired by village. Hydrants, public, 35. FINANCIAL.—Cost, $23,000. Bonded debt, $22,500, at 5%; due in 20 yrs. Expenses: Operating, $800; int., $1,225. MANAGEMENT.—Trustees, Secy., Dr. J. S. Elder; Treas., C. D. Parkinson; Supt., Melvin Thompson. Rept. by Secy., June, '96. SEWERS.—None.

92. **MINERVA,** Stark and Carroll Cos. (1,139.) Built in '86 by town. SUPPLY.—Two wells on bank of creek, pumping to tank. Connection with creek (rept. in '89) for emergency. PUMPS.—Smith-Vaile; also 500,000 Worthington comp. non-cond. DISTRIBUTION.—Taps, 170. Meters, none. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $15,000. Bonded debt, $12,000, at 6%; due 1906. Expenses: Operating, $447. Revenue: Consumers, $1,171. MANAGEMENT.—Trustees. Prest., T. J. Perdue; Secy., C. H. Unkefer; Supt., H. W. Speakman. Rept. by Secy., Sept., 24, '96.

93. **MONTPELIER,** Williams Co. (1,293.) Built in '95 by Co.; put in operation in Dec. Engrs., Voorhees & Witmer, Buffalo; Contrs., Sykes & Wegner. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. non-cond. Av. cost of coal used, $3.00 per short ton. STAND-PIPE.—Cap., 93,000 galls.; steel, 12 x 110 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 80; made by Co. for $6, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 0. Use of meters optional with Co. Hydrants, public, 60. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $26,000. MANAGEMENT.—Prest., E. A. Collins; Secy., J. D. Hill; Treas., Jacob Leu; Supt., J. F. Wertz; Ch. Pump. Engr., C. G. Beckwith. SEWERS.—Has storm sewers only.

P 6. **MOUNT GILEAD,** Morrow Co. (1,329.) May 8, '96, Village Clk., Geo. J. Young, rept. authority had been secured to issue $48,000 water bonds, but Council had taken no action. In '87, town put in two hydraulic rams and pipe to supply five public watering places.

94. **MOUNT STERLING,** Madison Co. (752.) Built in '96 by villtge; put in operation May 9. Engr., E. C. Cooke, Cleveland; Contr., W. R. Richards. SUPPLY.—Deep well, pumping to small reservoir, thence by direct pumping. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 McGowan dup. high pressure and a 150,000 deep well. Hocking Valley run of mine coal used; av. cost, $2 per short ton, delivered. RESERVOIR.—Cap., 110,000 galls.; close by station. DISTRIBUTION.—Mains, 3 miles. Taps, 35; made by village. Services paid for by consumer from curb. Meters, none. Use of meters optional with village. Hydrants, public, 28; private, 12. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary, 65 lbs., fire, 100 lbs. FINANCIAL.—Bonded debt, $12,000, at 6%; due in 10 and 20 yrs. MANAGEMENT.—Village Council. Supt., John W. Hana-

walt; Ch. Pump. Engr., R. A. Bryson. Rept. by Supt., Nov. 16, '96. PROJECTED IMPROVEMENTS.—Possibly a stand-pipe. SEWERS.—None.

95. **MOUNT VERNON,** Knox Co. (6,027.) Built in '82 by town. SUPPLY.—24 3 to 6-in. wells, pumping to stand-pipe. PUMPS.—Cap., 3,500,000 galls.; 1,000,000 Worthington and 2,500,000 McGowan comp. cond. Pea coal used; av. cost, $1.25 per short ton. STAND-PIPE.—Cap., 205,632 galls.; 25 × 56 ft., on a hill 170 ft. above pumps. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION, Mains, 21 miles; cost extension met by earnings. Taps, 900; made by town. Services, tarred iron; paid for by consumer from curb. Town can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 4. CONSUMPTION.—(Galls.)av., 1,000,000. PRESSURE.—Ordinary, 95 lbs.; fire, 115 lbs. FINANCIAL.—Cost, $100,000. Bonded debt, $35,000. Expenses, Operating, $7,000. MANAGEMENT.—Prest., W. A. Bounds; Secy., P. B. Chase; Supt., C. W. Koons; Ch. Pump. Engr., O. Hogle. Rept. by Supt., June 4, '96. PROJECTED IMPROVEMENTS.—Purchase of 25 acres additional land for artesian wells; will also be used as a public park. SEWERS.—None.

96. **NAPOLEON,** Henry Co. (2,764.) Built in '95 by city; put in operation Apr. 1. Engr., J. B. Strawn, Salem; Contr., Toledo Construction Co., Toledo. SUPPLY.—Maumee River, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Smith-Vaile & Stillwell-Bierce, vertical comp. cond. Wheeling and Lake Erie bituminous coal used; av. cost, $2.85 per short ton delivered; Jackson Hill, $2.25 ditto. STAND-PIPE.—Cap., 293,750 galls.; steel; 20 × 125 ft. FISCAL YEAR CLOSED Apr. 15. DISTRIBUTION.—Cost extensions met by sinking fund or bond issue. Taps, 236; made by consumer for $6, including 15 ft. service or less; $9.00 for 15 to 30 ft.; 31 ft. or more, 17 cts. per ft. Services, iron and lead; paid for by consumer. Meters: 14; owned by consumer; controlled and repaired by city at consumer's expense. City can compel use of meters and any consumer may have one. Hydrants, public, 76; private, 3. PRESSURE.—Ordinary, 35 lbs.; fire, 100-140 lbs. Steam fire engines only used in case of emergency. FINANCIAL.—Cost, $63,912 (for water and light plant combined). Bonded debt, $60,000, at 5%. Expenses: Operating, $7,016 (water and light combined); int., $3,000. Revenue, Consumers, unmetered, $1,893. MANAGEMENT.—Prest. of Board, E. A. Augenstein; Secy. and Supt., Wm. Kellogg; Ch. Pump. Engr., V. R. Hughes. Rept. by Wm. Kellogg, June 28, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Pumps, Eng. News, Mar. 28, '95, illus.

97. **NELSONVILLE,** Athens Co. (4,558.) Built by Co. in '94. PUMPS.—Cap., 2,000,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers as furnished in '94). No further information, except Wm. Dalrymple verifies existence and ownership.

98. **NEWARK,** Licking Co. (14,270.) Now owned by Newark Water-Works Co.; at present in hands of receiver. Built in '85-6 by Moffett, Hodgkins & Clark, Syracuse, N. Y. FRANCHISE.—20 yrs. from '85; provides for purchase of work by city. Rates are fixed in franchise. Co. is not exempt from local taxes. SUPPLY.—Wells, pumping to reservoir. First well was 30 × 24 ft. PUMPS.—Cap., 5,000,000 galls.; 2—2,500,000 Gordon-Maxwell. Bituminous slack coal used; av. cost, $0.95 per short ton in bin. RESERVOIR.—Cap., 3,500,000 galls.; storage, 263 ft. above city datum. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 28½ miles; cost extensions met by revenue. Taps, 13; made by Co. Services, galv. i.; paid for by Co. to property line. Meters: 160; owned by consumers mostly; controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 269. PRESSURE.—Ordinary and fire, 113 lbs. FINANCIAL.—(In '88.) Cost, $300,000. Bonded debt, $260,000 at 6%. Expenses, $21,600: Operating, $6,000; int., $15,600. Revenue, Consumers, $12,500; City (in '90), $10,890. MANAGEMENT.—Rept. by Receiver, Wm. Allen Veach, July 13, '96. SEWERS.—Has sanitary sewers.

99. **NEW LISBON** (P. O. Lisbon), Columbiana Co. (2,278.) Built in '40; new works built in '88 by town. SUPPLY.—Artesian wells, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; Gordon & Maxwell dup. RESERVOIR.—Cap., 400,000 galls. DISTRIBUTION.—Mains, 8.3 miles. Taps, 154. Meters, 4. Hydrants, public, 40. FINANCIAL.—(In '88.) Cost, $25,000. Bonded debt, $16,000 at 6%. SEWERS.—Has sewers. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, June 3, '82.

100. **NEW PHILADELPHIA,** Tuscarawas Co. (4,456.) Now controlled by the American Water-Works & Guarantee Co., Pittsburg, Pa. Built in '86 by New Philadelphia Water Co. SUPPLY.—Wells, pumping to reservoir. PUMPS.—Cap., 4,000,000 galls.; 2—1,000,000 Blake; 2,000,000-Laidlaw-Dunn-Gordon. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 11 miles. Hydrants, public, 104. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., O. P. Taylor; Secy. and Treas., J. H. Purdy; Supt., D. B. Ludwick. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96.

101. **NILES,** Trumbull Co. (4,289.) Built in '91 by city; put in operation in Dec. Engr., J. B. Strawn, Salem; Contr., C. H. Connell, Youngstown. Water and electric light plants were operated together in '91. SUPPLY.—Wells, pumping to reservoir. There were 11 wells in '91, with av. depth of 52 ft., water flowing to surface, 11 ft. above river. Wells near Mahoning River, with which there is pipe connection for emergency use. PUMPS.—Cap., 1,250,000 galls.; Hughes dup. Pennsylvania bituminous

slack used; av. cost, 85 cts. per short ton. RESERVOIR.—Cap., 1,250,000 galls. (500,000 covered reservoir rept. in '91). FISCAL YEAR CLOSED Mar. 20. DISTRIBUTION.—Mains, 13 miles; cost extensions met by water rents. Taps, 450; made by city for $9.50, including service to curb. Services, iron; paid for by consumer. Meters: 15; owned, controlled and repaired by city; yearly rental, 10% of cost per yr. Use of meters compulsory for saloons and manufactories. Village can compel use of meters and any consumer may have one. Hydrants, public, 83; private, 1. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary and fire, 87 lbs. FINANCIAL.—Cost, $67,000. Bonded debt, $67,000, at 6%, due 1901 and yearly thereafter. Sinking Fund, none. Expenses, Operating, $1,800; int., $3,420. MANAGEMENT.—Prest., S. F. Bycraft; Secy., G. L. Campbell; Treas., E. H. Hall. Rept. by Secy., June 15, '96; also by Engr., in '91. SEWERS.—Has storm sewers only.

102. **NORTH BALTIMORE,** Wood Co. (2,857.) Built in '92 by Co.; put in operation in June. Engr. and Contr., W. S. Coon. Works now owned by North Baltimore Water & Electric Co. This Co. (press rept.) organized by parties who bought works at court sheriff's sale, to satisfy material men, in Mar., '94; works appraised at $33,000 and sold for $29,934. FRANCHISE.—30 yrs. from '92, with option of purchase of works by city. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $3,600 for public service. No legal difficulties. SUPPLY.—Driven wells, pumping to stand-pipe. PUMP.—Cap., 1,000,000 (makers rept. 2,000,000) galls.; Laidlaw-Dunn. Gas used. STAND-PIPE.—Cap., 165,000 galls.; steel; 16 × 110 ft., on concrete foundation. FISCAL YEAR CLOSED April, '96. DISTRIBUTION.—Mains, 9 miles; cost extions met by revenue. Taps, 500; made by Co. for $6.25. Services, galv. 1 and lead; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 81. CONSUMPTION.—(Galls.) av., 189,000. PRESSURE.—Ordinary, 50 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock, authorized, $80,000; all paid-up. Bonded debt, $50,000 at 6%, due in 1917. No sinking fund; will be begun next year ('97). Expenses, $5,026: Operating, $2,000; int., $3,000; taxes, $26. Revenue, $6,000: Consumers, $2,500; City, fire portection, $3,500. MANAGEMENT.—Prest., C. W. Harrison; Secy., C. J. Rockwell; Treas., L. Wooster; Supt., H. Bottomly. Rept. by Treas., Dec. 11, '96. SEWERS.—Has sanitary sewers only.

P 7. **NORTH LEWISBURG,** Champaign Co. (866.) Legislative authority to issue bonds for works secured in '96, but nothing further done. Rept. by citizen, Aug., '96.

103. **NORWALK,** Huron Co. (7,195.) Built in '71-2 by city. Improvements under way and projected in '97. Engr., L. E. Chapin, Canton, O.; Asst. Engr., E. A. Smith. SUPPLY.—Huron River, Peru and Cole Creek, by pumping. PUMPS.—Cap., 2,500,000 galls.; Worthington, 1,500,000 and 1,000,000. Bituminous lump coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 15,000,000 galls. (under construction?). In '96 contract for reservoirs was awarded. FISCAL YEAR CLOSED Mar. DISTRIBUTION.—Mains, 15½ miles; cost extensions met by tax levy. Taps, 800; made by consumer. Services, lead; paid for by consumer. Meters, 0. Use of meters optional with city. Hydrants, public, 116; private, 7. CONSUMPTION.—(Galls.) av., 1,400,000. PRESSURE.—Ordinary, 25 to 30 lbs.; fire, 50 lbs. FINANCIAL.—Expenses, Operating, $6,000. Revenue, Consumers, $6,000. Deficits are met by general taxation. MANAGEMENT.—Prest., W. E. Sidwell; Secy. and Supt., A. F. Rowland; Ch. Pump. Engr., Jno. H. Rumsey. Rept. by Supt., June 4, '96, and Asst. Engr. (see above) Jan. 2, '97. PROJECTED IMPROVEMENTS.—3,000,000 or 4,000,000-gall. pump and stand-pipe. SEWERS.—Has partial systems of sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 24, '81.

104. **NORWOOD,** (Station H, Cincinnati P. O.), Hamilton Co. (Est. 845.) Built in '94 by village. Engr., G. Bouscaren, Cincinnati; Contrs., Herbert & Lapeyre, Chattanooga, Tenn. SUPPLY.—Deep wells, pumping to stand-pipe; 1 6-in. and 5 8-in. wells, with av. depth of 235 ft. PUMPS.—1,000,000 galls. Laidlaw-Dunn-Gordon. Wellston mine run bituminous coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 531,382 galls.; steel; 40 × 60 ft., with conical steel roof extending over a gallary, accessible by a winding stairway. FISCAL YEAR CLOSED Apr. 6. DISTRIBUTION.—Mains, 25 miles; cost extensions met by bonds. Taps, 576; made by village. Services, ¼-in. lead; paid for by property owner. Meters, 5; owned and repaired by consumer; controlled by village. Use of meters optional with consumer; compulsory for R. R. stand-pipe. Hydrants, public, 140. CONSUMPTION.—(Galls.) av., 40,000; max., 200,000; min., 50,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $183,152. Bonded debt, $130,000. Expenses, Operating, $4,349. Revenue, $6,843. MANAGEMENT.—Prest. of Bd. of Trustees, Henry Rikhoff; Secy., Herman Eidman; Treas., Louis Winkelman. Rept. by Julius A. Brockhoff, Clk, June 15, '96. SEWERS.—Has sanitary and storm sewers.

105. **OBERLIN,** Lorain Co. (4,376.) Built in '87 by town. SUPPLY.—East branch of Vermillion River, pumping from storage reservoirs to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Deane 1,000,000 high pressure, and 1,000,000 comp. cond. Bituminous coal used; av. cost, $2.05 per short ton in bin. RESERVOIRS.—Cap., 16,250,000 galls. storage: 1,000,000 near pumping station and 15,250,000. TANK.—Cap., 66,640 galls: steel, 18 × 35 ft., on stone tower, 40 ft. high. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 7.8 miles; cost extensions met by water rentals. Taps, 443;

made by town for $8, including service to curb. Services, lead; paid for by consumer. Meters, 137; owned by town or consumer; controlled and repaired by town. Yearly rental, $3. Use of meters compulsory for manufacturers and irregular consumers. Town can compel use of meters and any consumer may have one. Hydrants, public, 72. CONSUMPTION.—(Galls.) av., 76,707; max., 181,089; min., 37,753. PRESSURE.—Ordinary, 30 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $76,474. Floating debt, $5,000, at 5¾%; bonded, $48,000, at 4½%; due '96 to 1916; $5,000, at 5%, due '96 to 1903. Sinking Fund, $2,400. Expenses: Operating, $1,897; int., $2,700. Revenue: Consumers, unmetered, $2,104; metered, $1,740. Deficit of $2,873 met by taxation. MANAGEMENT.—Prest., A. A. Wright; Secy., A. Deming; Treas., Geo. C. Prince; Supt., W. B. Gerrish; Ch. Pump. Engr., H. W. Braithwaite. Rept. by Supt., June 4, '96. SEWERS.—Has sanitary and storm sewers.

106. **ORRVILLE,** Wayne Co. (1,765.) Built in '94 by town; put in operation, July 15. Engr., Alexander Potter, 137 Broadway, New York; Contr., H. D. Shannon. SUPPLY.—Four 8-in. artesian wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Laidlaw-Dunn-Gordon dup. Bituminous slack used; av. cost, $1.20 per short ton, delivered. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 5½ miles. Taps, 195; made by consumer for $7. Services, galv. i.; paid for by owner of property. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 39. CONSUMPTION.—(Galls.) av., 50,000; max., 200,000; min., 30,000. PRESSURE.—Ordinary, 65 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $23,000, at 6%; due $1,000 annually for 30 yrs. Expenses: Operating, $1,300; int., $1,300. Revenue, Consumers, $950. Deficits of $1,500 met by taxation. MANAGEMENT.—Prest., D. F. Griffith; Secy. and Treas., A. J. Heller. Rept. by Prest., June 12, '96. SEWERS.—None.

107. **OSBORN,** Greene Co. (713.) Built in '96 by village; put in operation Feb. 9. Engr., Wm. G. Moler, Springfield; Contr., R. N. Andrews, Hamilton. SUPPLY.—Four 6-in. driven wells, pumping to stand-pipe; suction, 13 ft. PUMP.—Cap., 500,000 galls.; Laidlaw-Dunn-Gordon comp. dup. Bituminous coal used; av. cost, $1.75 per short ton. STAND-PIPE.—Cap., 73,000 galls.; steel plates, ⅛ to 3-16 ins. thick; six web brackets; 10 × 125 ft. on stone foundation. DISTRIBUTION.—Mains, not given; cost extension met by tax. Taps, 90. Services, galv. i.; paid for by village to curb. Meters, 0. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary and fire, 57 lbs. FINANCIAL.—Cost, $22,000. Bonded debt, $20,000, at 6%; due in 20 years; $1,000 due yearly, with int.. Expenses: Operating, $1,500, including electric plant. Deficits are met entirely by taxation. MANAGEMENT.—Prest., M. L. Finnell. Rept. by Secy., H. G. Kilheffer, Dec. 8, '96. SEWERS.—None.

108. **OXFORD,** Butler Co. (1,922.) Built in '96 by village; put in operation June 30. Des. Engr., J. F. Witmer, Buffalo, N. Y.; Contr., John Bartow, Port Huron, Mich. SUPPLY.—Well, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Stilwell-Bierce and Smith-Valle comp. dup. Bituminous coal used; av. cost, $1.75 per short ton. DISTRIBUTION.—Mains, 6¾ miles. Taps, 106; made by village, free. Services, galv. i.; paid for by property owner. Meters, 7; owned, controlled and repaired by village; yearly rental, none. Use of meters optional with village; compulsory for colleges, laundries and manufacturers. Hydrants, public, 43. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $36,000. MANAGEMENT.—Trustees. Prest., Henry Snyder. Rept. by Secy., S. H. Allen, Nov. 28, '96. SEWERS.—None.

109. **PAINESVILLE,** Lake Co. (4,755.) Now owned by city. Present works built in '91 by Painesville Water Co., to supply Painesville, Richmond and Fairport; first supplied in '82. In '95 there were legal difficulties between Co. and city; in '96 city sold $150,000 of 5% bonds, due '97 to 1926; in Jan., '97, it bought works for $150,000. SUPPLY.—Wells, springs and Lake Erie, pumping to stand-pipe and direct. PUMPS.—Cap., 5,500,000 galls.; 2—2,000,000 and 1—1,500,000 Knowles comp. cond. (Makers rept., 2—1,250,000 comp. non-cond. and 1,000,000 simple high pressure Worthington.) STAND-PIPE.—Cap., 169,000 galls.; 20 × 72 ft.; 200 ft. above pumps. DISTRIBUTION.—Mains, 15 miles. Taps, 600. Hydrants, 70. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $250,000. Cap. Stock, $250,000. Bonded debt, $250,000. Expenses, $16,200: Operating, $3,700; int., $12,500. Revenue, $18,000: Consumers, $13,000; City, $5,000; hydrant rental, $60. NOTE.—No rept. since '90-1 Manual.

110. **PERRYSVILLE,** Ashland Co. (522.) Built in '95 by Co.; put in operation Aug. 15. Engr., J. B. Strawn, Salem; Contrs., Snyder & Williams, Dayton. SUPPLY.—Well, 92 ft. deep, pumping to reservoir. PUMPS.—Cap., 14,400 (?) galls.; Smith-Valle. RESERVOIRS.—Cap., 567,000 galls.; 175 ft. above pumping station, 180 ft. above town. DISTRIBUTION.—Mains, 2 miles; cost extensions met by Co. Taps, 50; made for $7. Hydrants, public, 25. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $6,000. Bonded debt, $5,000, at 6%. Expenses, Operating, $200. Revenue, Consumers, $50. MANAGEMENT.—Prest., L. S. Van Gilder; Secy., J. B. Childs: Treas., G. Sheehan; Ch. Pump. Engr., J. Derrow. Rept. by Prest., Aug. 29, '96. SEWERS.—Has storm sewers.

111. **PIEDMONT,** Harrison Co. (Not given.) Built in '94 by Co.; put in operation May 5. Engr., J. J. Sears. FRANCHISE.—99 yrs. from '94. No compensation for public service. SUPPLY.—Spring and well, pumping to reservoir. PUMP.—Cap., 1,000

galls.; Pearl wind engine and pump. RESERVOIR.—Cap., 10,000 galls. FISCAL YEAR CLOSED Apr. 8. DISTRIBUTION.—Mains, 3,000 feet; cost extensions met by sale of bonds. Taps, 20; made by Co. Services, galv. i.; paid for by consumer from curb line. Hydrants, public, 8; private, 5. CONSUMPTION.—(Galls.) av., 800 est. FINANCIAL.—Cost, $1,000. Cap. Stock, authorized, $5,000; paid-up, $1,000; paid 9½% div'd in '95. No debt. Revenue, Consumers, $95. MANAGEMENT.—Prest., J. R. Nibbs; Secy. and Supt., J. J. Sears; Treas., R. S. Nibbs. Rept. by Secy., Aug. 13, '96.

112. **PIQUA,** Miami Co. (9,090.) Built in '75 by city. SUPPLY.—Miami and Erie Canal, pumping direct. PUMPS.—Cap., 4,000,000 galls.; 2,000,000 Flanders and 2,000,000 Gordon water power. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 23 miles; cost extensions met by receipts. Taps, 1,400; made by city for $1. Services, iron and lead; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 186. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. One steam fire engine is used for emergency. FINANCIAL.—Cost (in '90), $380,000. Bonded debt (in '90), $290,000, at 6 and 8%. Expenses: Operating, $4,960; int., $2,150. Revenue, Consumers, $11,311. Overdrafts are carried over and paid when possible. MANAGEMENT.—Prest. and Supt., W. F. Robbins; Secy., W. B. Mitchell; Treas., City Treas.; Ch. Pump. Engr., Edw. Lines. Rept. by Secy., July 8, '96. PROJECTED IMPROVEMENTS.—Auxiliary steam pump. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 8, '82.

113. **PLAIN CITY,** Madison Co. (1,245.) Built in '94 by village in connection with electric light plant. Engr., Frank Snyder, Columbus. SUPPLY.—Artesian well, pumping (direct?). Pumps 4 ft. above ground level and water rises to pumps; well 250 ft. in rock. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 McGowan comp. dup. DISTRIBUTION.—Mains, 4 miles. Taps, 300. Hydrants, 32. CONSUMPTION.—No record or estimate. FINANCIAL.—(Both water and light.) Cost, $35,000. Expenses, Operating, but not including repairs, about, $3,120. Revenue, about $3,600. MANAGEMENT.—Rept. by E. H. Malott, Dec. 30, '96.

114. **PORT CLINTON,** Ottawa Co. (2,049.) Built in '95 by village; put in operation Nov. 1. Engrs., O. J. True and C. E. De Witt; Contrs., Shaw, Kendall & Co., Toledo. SUPPLY.—Lake Erie, pumping direct. A 16-in. intake pipe, 2,400 ft. long, connects with crib. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon. Hocking Valley run of mine coal used; av. cost, $1.90 per short ton. FISCAL YEAR CLOSED Nov. 1, '96. DISTRIBUTION.—Mains, 9½ miles. Taps, 213; made by village for $4 to $5. Services, lead; paid for by consumer. Meters, 1; owned and repaired by consumer; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 67; private, 2. CONSUMPTION.—(Galls.) av., 300,000; max., 350,000; min., 250,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $42,005. Bonded debt, $42,000. Expenses, Operating, $2,505. Revenue, Consumers, unmetered, $2,108. All deficits are met by taxation. MANAGEMENT.—Prest., O. J. True; Secy. and Supt., Wm. Generous; Treas., B. W. Wilson; Ch. Pump. Engr., John White. Rept. by Chas. E. De Witt, Dec. 21, '96. SEWERS.—Has combined sanitary and storm sewers.

115. **PORTSMOUTH,** Scioto Co. (12,394.) Built in '71 by city. SUPPLY.—Ohio River, pumping direct. PUMPS.—Cap., 9,000,000 (?); Laidlaw-Dunn-Gordon (makers rept. 5,000,000 furnished in '93, 2,500,000 in '94, and 3,000,000 in '95). DISTRIBUTION.—Mains, 25 miles; cost extensions met by income. Taps, 2,500; made by city for $7. Services, iron and lead; paid for by consumer. Meters, 0. Hydrants, public, 150; private, 6. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $300,000. Bonded debt, $185,000, due $50,000 in 1901 and thereafter. MANAGEMENT.—Prest., Jno. M. Williams; Secy., Thos. S. Hall; Supt., J. T. Walkins; Ch. Pump. Engr., C. Molster. Rept. Aug. 17, '96. SEWERS.—None. REFERENCE.—Eng. News, Aug. 19, '82.

116. **RAVENNA,** Portage Co. (3,417.) Built in '85 by city. SUPPLY.—Crystal and Muzzy Lakes, and five artesian wells, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 3—1,000,000 Knowles. Smock coal used; av. cost, $1.40 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 19 miles; cost extensions met by earnings. Taps, 1,100; made by city, free. Services, galv. i.; paid for by consumer. Meters: 14; owned, controlled and repaired by city. Use of meters optional with city; compulsory for large consumers. Hydrants, public, 115; private, 12. CONSUMPTION—(Galls.) av., 600,000; max., 900,000; min., 300,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $175,000. Bonded debt, $84,000, at 6%; due '96. Sinking Fund: $2,270, applied on bonded debt. Expenses, Operating, $5,031. Revenue, Consumers, unmetered, $6,600; metered, $3,000. MANAGEMENT.—Prest., Geo. F. Douthitt; Secy., A. W. Stocker; Treas., D. F. Stocker; Supt., W. H. Linton; Ch. Pump. Engr., E. M. Davis. Rept. by Treas., July 9, '96. SEWERS.—Has storm sewers only.

117. **READING,** Hamilton Co. (3,621.) Built by village. Sells water through meters to Lockland and Arlington Heights. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon dup. and 192,000 Bradford deep well. Youghigheny nut and slack coal used; av. cost, $1.70 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; distributing; elev. 190 ft., on hill. DISTRIBUTION.—Taps, 65; made by village. Services, lead; paid for by consumer. Meters: 4; owned and

repaired by consumer; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, private, 8. CONSUMPTION.—(Galls.) av., 71,000; max., 150,000; min., 19,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Bonded debt, $45,000, at 5%; due in 20 to 30 yrs. Cannot give separate items, as water and light plant are run together. MANAGEMENT.—Prest. Bd. of Trustees, John Haverty. Rept. by Ch. Pump. Engr., Henry Ketter, Nov. 12, '96. SEWERS.—None.

109. **RICHMOND,** Jefferson Co. (444.) Supply from Painesville.

118. **RIPLEY,** Brown Co. (2,483.) Built in '96 by town; was to be put in operation by Dec. 10. Engr., E. F. Layman, Cincinnati. SUPPLY.—Ohio River, pumping to reservoir from settling basins and two 8-in. wells. SETTLING BASINS.—Cap., 500,000 (?) galls.; two. PUMPS.—Cap., 500,000 (?) galls. Two Hall air lift and one Hall steam. Bituminous coal used; av. cost, $1.75 per short ton. RESERVOIRS.—Cap., 500,000 galls.; about 60 ft. diam., 16 ft. deep; about 360 ft. above town. DISTRIBUTION.—Mains, 5½ miles; cost extensions will probably be met by additional appropriations. Taps will be about 210; made by town. Services, lead; paid for by town to curb. Meters, 0. Hydrants, public, 42. PRESSURE.—Ordinary, 130 lbs.; fire, 180 lbs. Town owns three steam fire engines. FINANCIAL.—Cost, $23,000. Bonded debt, $23,000, at 5%, due in 30 yrs. MANAGEMENT.—Prest., W. A. Dixon; Secy., L. Vern Villiaias; Ch. Pump. Engr., Robt. Rice. Rept. by M. T. Layman, Dec. 7, '96. SEWERS.—Has limited storm sewers only.

27. **RIVERSIDE,** Hamilton Co. Now part of Cincinnati, which see.

119. **ROCKFORD,** Mercer Co. (Not given.) Built by city; put in operation Jan. 1, '97. Engr., Burton J. Ashley, Chicago. Contr., T. C. Brooks, Jackson, Mich. SUPPLY.—Deep well, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon comp. dup.; also deep well pump. Av. cost of coal used, $2.25 per short ton. RESERVOIR.—Cap., 33,000 galls.; distributing. STAND-PIPE.—Cap., 71,000 galls.; steel, 11 × 100 ft. DISTRIBUTION.—Mains, 3½ miles. Hydrants, public, 20. PRESSURE.—Ordinary, 43 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $13,500. MANAGEMENT.—Water-Works Trustees; Prest., D. H. Robinson; Secy., J. W. Smith; Supt., Clay Davis. Rept. by Burton J. Ashley, Des. Engr., Dec. 28, '96. SEWERS.—None. REFERENCE. Eng. News, Jan. 7, '82.

120. **SAINT BERNARD,** Hamilton Co. (1,779.) Built in '94 by city; put in operation in Jan., '95. Engr., Geo. Hornung, Cincinnati. Water and electric light plants operated together. SUPPLY.—Driven wells, pumping direct and to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Laidlaw-Dunn-Gordon comp. dup. non-cond., with outside packed plunger. Ohio bituminous coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 270,000 galls.; steel, 20 × 115 ft. FISCAL YEAR CLOSED April, '96. DISTRIBUTION.—Mains, 8 miles. Meters: 8; owned, controlled and repaired by city. Hydrants, public, 52. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $64,320. MANAGEMENT.—Prest., Chas. W. Mayer; Secy., Henry Imwalle. Rept. by Geo. Hornung, Des. Engr., Jan., '97. REFERENCE.—Stand-pipe scaffolding, Eng. News, May 23, '95, illus.

121. **SAINT MARY,** Auglaize Co. (3,000.) Built in '96 by city; put in operation Aug. 1. Engr., Jno. W. Hill, Cincinnati. SUPPLY.—Four driven wells supplying large pump well, pumping direct. PUMPS.—Cap., 1,500,000 galls.; comp. dup. Natural gas used. DISTRIBUTION.—Mains, 9½ miles. Taps, 192; made by city. Services, lead; paid for by consumer. Meters: 7; owned by consumer; controlled and repaired by city. Use of meters optional with consumer. Hydrants, public, 102. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Prest., O. E. Dunan; Secy., H. W. Stearns; Treas., H. G. McLain, Rept. by Supt., J. H. Arbogast, Aug. 3, '96. SEWERS.—None.

122. **SALEM,** Columbiana Co. (5,780.) First supplied in '62 by A. Phillips; present system built in '87 by Salem Water Co. Press repts. state works have been in hands of receiver since Dec. 24, '92, C. A. Judson resigning position in Jan., '97, and being succeeded by Hermon Kelly, of Cleveland. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city at end of any 5 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $4,600 per yr. for public service. SUPPLY.—Eight deep wells and one spring, pumping to stand-pipe. PUMPS.—Cap., 4,500,000 galls.; 3—1,500,000; two Blake and one Deane. (Makers rept., dup. and comp. dup. Deane, latter added in '95, with combined capacity of 2,600,000 galls.) Run of mine bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; storage. STAND-PIPE.—Cap., 320,000 galls.; steel; 25 × 85 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 18 miles; cost extensions met by Co. Taps, 1,200; made by Co. for $2. Services, galv. i.; paid for by consumer. Meters: 40; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for livery stables, factories, greenhouses and motors. Hydrants, public, 175; private, 5. CONSUMPTION.—(Galls.) av., 350,000; max., 550,000; min., 175,000. PRESSURE.—Ordinary, 60 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $150,000. Cap. Stock: Authorized, $250,000. Expenses: Operating, $5,000; taxes, $1,200. Revenue: Consumers, unmetered, $10,000; metered, $500; City, fire protection, $4,500. MANAGEMENT.—Prest. and Treas., Calvin A. Judson, Cleveland; Secy. and Supt., F. W. Allison; Clk., J. T. Harding; Ch. Pump.

Engr., Saml. Mellinger. Rept. by Supt., June 4, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Dec. 30, '82.

123. **SALINEVILLE,** Columbiana Co. (2,369.) Built in '92-3 by city; tested Feb. 25. Engr., J. B. Strawn, Salem. SUPPLY.—8 drilled wells, about 100 ft. deep, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Hughes comp. dup. RESERVOIR.—(Cap., 360,000 galls.; roofed?); 330 ft. above lower part of village. DISTRIBUTION.—Mains, 6 miles. Hydrants, 56. MANAGEMENT.—Rept. by J. B. Strawn, Salem, just after completion; hence subject to revision.

124. **SANDUSKY,** Erie Co. (18,471.) Built in '75-6 by city. SUPPLY.—Sandusky Bay, an arm of Lake Erie, pumping to stand-pipe. Intake, 36-in. w. l.; 413 ft. brick and 1,387 ft. w. l., extending to stone and timber crib. PUMPS.—Cap., 10,500,000 galls.; 3,000,000 and 7,500,000 Worthington comp. cond. Hocking Valley run of mine coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 661,000 galls.; "Ohio steel," ⅞-in. at bottom, 3-16-in. at top: 25 × 180 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 40 miles; cost extensions met by water rents. Taps, 2,641; made by city at $3 for ¾-in.; including curb cock and box. Services, lead; paid for by consumer from middle of street. Meters, 341; owned, 236 by city, 105 by consumers; controlled by city; repairs paid by owner of meter. Use of meters compulsory for manufacturing, business blocks, motors and R. Rs. Residences are not metered, owing to lack of funds. City can compel use of meters and any consumer may have one. Hydrants, public, 283; private, 12. CONSUMPTION.—(Galls.) av., 3,781,000; max., 4,700,000; min., 3,200,000. A large amount is consumed by schools, parks and fountains and by Soldiers' Home, all of which is free. PRESSURE.—Ordinary, 55 lbs.; fire, 65 to 100 lbs. FINANCIAL.—Cost, $541,000. Bonded debt, $219,000: $65,000, at 4½%; due yearly from '96 to 1908; $154,000, at 5%; due yearly, '96 to 1905. No sinking fund. Expenses: Operating, $14,000; int., $1,500. Revenue, street sprinkling, $550. No deficits have occurred. $30,000 in bonds, being a recent issue for extensions, will be paid partly by rentals, balance by general tax. MANAGEMENT.—Prest., Adam Kolb; Secy., Wm. J. Affleck; City Treas., G. Graham; Supt., C. A. Judson; Ch. Pump. Engr., John Gaa. Rept. by Supt., Jan. 16, '97. PROJECTED IMPROVEMENTS.—Quality of supply is to be improved either by extension of intake 3 miles into lake or by filtration; no progress. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, July 30, '81, stand-pipe failure, Nov. 18, '86.

125. **SHELBY,** Richland Co. (1,977.) Under construction '96-7 by Shelby Water Co.; to be put in operation about June 1. Engr., J. C. Fish. FRANCHISE.—20 yrs. from '97. Co. is not exempt from local taxes. City to pay $5,000. No legal difficulties. SUPPLY.—Filter galleries, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 McGowan comp. FILTER GALLERIES.—Cap., 1,500,000 galls.; Contrs., Wagner Water Supply Co., Dayton. STAND-PIPE.—Cap., 58,700 galls.; steel; 16 × 125 ft. DISTRIBUTION.—Mains, 10 miles. Taps, made by Co. for $5, including service to curb. Services, galv. i.; paid for by consumer. Meters owned and controlled by Co.; repairs paid by consumer. Use of meters compulsory for R. R. and factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 20. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $21,000. Cap. Stock: Authorized, $80,000; paid-up, $8,000. Bonded debt, none. Revenue: City, fire protection, sewer flushing and public buildings, $5,000. MANAGEMENT.—Prest., M. H. Davis; Secy., J. W. Williams; Treas., D. V. Whury. Rept. by Supt. and Ch. Pump. Engr., J. C. Fish, Sept. 7, '96. SEWERS.—About to be constructed; will be built by time works are in operation.

126. **SHREVE,** Wayne Co. (1,012.) Built in '93 by village; put in operation Oct., '93. Engr., S. J. Kirkwood, Wooster. Contr., R. B. Carothers, Covington, Ky. SUPPLY.—Deep well (pumping direct?) PUMPS.—250,000-gall. Laidlaw-Dunn-Gordon deep well and Miller dup. Bituminous slack used; av. cost, $1.30 per short ton. RESERVOIR.—Cap., 90,000 galls.; 31 ft. in diam., 16 ft. deep. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 2 miles. Taps, 73; made by village for $7. Services, galv. i.; paid for by consumer. Meters, 73; owned by consumer; controlled by village. Use of meters compulsory for all consumers. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 3,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $8,000, at 6%; due 1913. Expenses: Operating, $350; int., $480. Revenue: Consumers, metered, $291. MANAGEMENT.—Prest., Otto Troutman; Secy., Chas. Collier; Ch. Pump. Engr., A. McConkey. Rept by Secy., Nov. 16, '96. SEWERS.—None.

127. **SIDNEY,** Shelby Co. (4,850.) First supplied in '73 by city; new works built in '88 by city. SUPPLY.—Driven wells, 120 ft. deep, in rock, and Miami River, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Gordon. (Makers rept. 3,000,000 Gordon furnished in '88; '89 Manual gave 1,500,000 and 1,000,000 Gordon.) Jackson (O.) nut coal used; av. cost, $2.34 per short ton. FILTERS.—Not in use. STAND-PIPE.—Cap., 212,000 galls.; 25 × 85 ft. DISTRIBUTION.—Mains, 13 miles. Taps, 900; made by city for $9; including service to curb. Services, galv. i.; paid for by property owner from curb. Meters, 50; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for manufacturers and large private houses. City can compel use of meters and any consumer may have one. Hydrants, public, 96. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 80 lbs.; fire, 150 lbs. Two steam fire en-

gines are used. FINANCIAL.—Cost, $100,000. Works are self-supporting. MANAGEMENT.—Secy., Jno. McCuen. Rept. by Supt., J. P. Maloy, June 3, '96. SEWERS.—None. REFERENCE.—Eng. News, Mar. 4, '82.

128. **SPRINGFIELD,** Clark Co. (31,895.) Built in '81-2 by city. SUPPLY.—Subterranean gravel bed (filter galleries?), pumping to stand-pipe. Quite extensive filter galleries indefinitely rept. previously. PUMPS.—Cap., 12,000,000 galls.; 7,000,000 Allis triple exp.; 5,000,000 Holly-Gaskill hor. high duty. Jackson lump bituminous coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 592,000 galls.; steel; 30 × 112 ft.; 220 ft. above center of city. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 59 miles. Taps, 3,500; made by consumer. Services, lead to curb; paid for by property owner. Meters, 150; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city. Hydrants, public, 360; private, 25. CONSUMPTION.—(Galls.) av., 2,500,000; max., 4,000,000; min., 1,500,000. PRESSURE.—Ordinary, 90 to 110 lbs. FINANCIAL.—Cost, $651,199; "have paid back $162,725." Bonded debt (in '90), $390,000. Expenses: Operating, $16,000. Revenue: Consumers, $39,000. MANAGEMENT.—Prest., E. C. Gwyn; Secy. and Treas., Wm. Smith; Supt., Geo. S. Cotter; Ch. Pump. Engr., W. C. Powell. Rept. by Supt., Aug. 18, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 5, '82.

129. **STEUBENVILLE,** Jefferson Co. (13,394.) First works built in '35 by city; new works built in '94-5 by city; put in operation Sept. 1. Engrs. for new works, Wilkins & Davison, Pittsburg, Pa.; Contr., A. W. McDonald, Richmond, O. SUPPLY.—Ohio River, pumping to reservoirs. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Allis vert. comp. (A 1,000,000 Laidlaw-Dunn-Gordon rept. by makers as constructed in '93; makers also rept. 4,000,000 Worthington comp. cond.) Av. cost of coal used, $1.08 per short ton. RESERVOIRS.—Cap., 7,200,000 galls.; three distributing, 1,700,000, total; cap., high pressure, 5,500,000. FISCAL YEAR CLOSED Feb. 15. DISTRIBUTION.—Mains, 41 miles; cost extensions met by bonds. Taps, 3,500; made by city. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 170; private, 3. CONSUMPTION.—(Galls.) av., 2,000,000; max., 3,000,000; min., 1,500,000. PRESSURE.—Ordinary, 70 to 120 lbs. Steam fire engines are used. FINANCIAL.—Cost, $175,000. Bonded debt, $100,000, at 4%; due in 20 or 30 yrs; $40,000, at 4%, due in 6 yrs.; $25,000, at 5%. Expenses: Operating, $13,000; int., $5,850. Revenue: Consumers, $22,000. MANAGEMENT.—Prest., D. J. Sinclair; Secy., Chas. Foreman; Treas., R. M. Brown. Rept. by Supt., S. B. Curfman, July 20, '96. PROJECTED IMPROVEMENTS.—Bonds issued for extension of high pressure system. SEWERS.—Has partial system of sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 2, '82.

130. **TIFFIN,** Seneca Co. (10,801.) Built in '78-9 by Tiffin Water-Works Co. FRANCHISE.—25 yrs. SUPPLY.—Drilled wells and Sandusky River, pumping direct. PUMPS.—Cap., 8,500,000 galls.; 4,000,000 Holly-Gaskill hor. high duty; 3,000,000 Holly-Gaskill hor. rotative; 1,500,000 Holly quadruplex water power. RESERVOIR.—Cap., 200,000 galls. DISTRIBUTION.—Mains, 30 miles. Taps, 1,100; made for $5. Services, lead; paid for by Co. Meters, 100; owned by Co. and consumers. Hydrants, public, 160; private, 2. CONSUMPTION.—(Galls.) av., 850,000; max., 1,500,000; min., 650,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 to 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Prest., M. Scannell, June 4, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Dec. 16, '82.

P S. TIPPECANOE CITY, Miami Co. (1,465.) Bids were to be received by city Jan. 13, '97, for water and electric light plants. Supply (wells?), pumping direct. Est. cost (water-works only?), $20,000. Repts. by Cy. Clk., Jno. M. Haaga, Sept. 2, '96, and Jan., '97.

131. **TOLEDO,** Lucas Co. (81,434.) Built in '73-4 by city. SUPPLY.—Maumee River, pumping to stand-pipe. (Filter basin with area of 19,000 sq. ft. previously rept. as becoming inadequate.) PUMPS.—Cap., 30,000,000 galls.: 1—15,000,000 Worthington vert. comp. high duty; 2—5,000,000 Worthington comp. cond.; 5,000,000 Knowles. Contracts let in fall of '96 for a duplicate of the 15,000,000-gall. Worthington. Jackson bituminous slack used; av. cost, $1.15 per short ton. STAND-PIPE.—Cap., 33,000 galls.; iron; 5 × 216 ft., inclosed in masonry tower. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 128 miles; cost extensions met by earnings. Taps, 8,567; made by consumer for $3. Services, lead to curb; paid for by property owner. Meters, 3,000; owned and repaired by consumer; controlled by city. Use of meters compulsory for factories, combination services and motors. City can compel use of meters and any consumer may have one. Hydrants, public, 685; private, 21. CONSUMPTION.—(Galls.) av., 7,841,207; max., 11,250,000; min., 6,000,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,600,000. Floating debt, $1,500,000, at 4½%. Expenses: Operating, $34,889; int., $46,280. Revenue, $113,963: Consumers, unmetered, $49,774; metered, $61,953; special permits, $2,236; City, none. No deficits. MANAGEMENT.—Prest., Wm. Jones; Secy., E. W. Eastele; Supt., T. R. Cook; Ch. Pump. Engr., F. Conover. Rept. by Supt., July 9, '96. PROJECTED IMPROVEMENTS.—New intake; 30-in. supply main under construction. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 30, '81.

132. **TORONTO,** Jefferson Co. (2,536.) Built in '90-1 by village; put in operation

July 20. SUPPLY.—Ohio River, pumping to reservoir. PUMP.—Cap., 1,500,000 galls.; Gordon vert. comp. Pittsburg bituminous slack and pea coal used; av. cost, $1 per short ton, delivered. RESERVOIR.—Cap., 3,000,000 galls.; 325 ft. above pumping station. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 9 miles; cost extensions met by revenue. Taps 400; made by city for $6, including service to curb. Services, lead; paid for by property owner from curb. City can compel use of meters and any consumer may have one. Hydrants, public, 56; private, 6. PRESSURE.—Ordinary and fire, 120 lbs. FINANCIAL.—Cost, $78,000. Bonded debt, $75,000, at 5%. Expenses: Operating, $2,000. Revenue, $4,000. Int. is paid by general taxation. MANAGEMENT.—Prest., Wm. Wellington; Secy., J. M. Jenks; Treas., W. G. McConnell; Supt., M. B. Edwards, Jr.; Ch. Pump. Engr., Ed. P. Williamson. Rept. by Supt., July 9, '96. SEWERS.—Has storm sewers only.

133. **TROY,** Miami Co. (4,494.) Built in '86-8 by town. SUPPLY.—Five wells, 50 ft. deep, pumping direct. PUMPS.—Smith-Valle water power and 1,000,000-gall. Laidlaw-Dunn-Gordon steam. Av. cost of coal used, $3.25 per short ton. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 10½ miles; cost extensions met by revenue and tax levy. Taps, 809; made by city for 90 cts. Services, iron and lead; paid for by consumer. Meters, 2; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city. Hydrants, public, 110. CONSUMPTION.—(Galls.) av., 24,000. PRESSURE.—Ordinary, 35 lbs.; fire, 70 to 100 lbs. One steam fire engine is used occasionally. FINANCIAL.—Cost (in '90), $80,000. Bonded debt (in '90), $80,000, at 6%. Expenses, $8,232: Operating, $2,882; int., $5,350. Revenue, $9,153: Consumers, $6,076; "all other sources," $3,077; City, pays int. on bonds. Deficits are met by general taxation. MANAGEMENT.—Prest., D. W. Sinks; Secy. and Supt., I. N. Price; Ch. Pump. Engr., B. F. Ross. Rept. by Supt., June 4, '96. SEWERS.—None.

134. **UPPER SANDUSKY,** Wyandot Co. (3,572.) Built in '89-90 by Upper Sandusky Water Co. FRANCHISE.—20 yrs.; provides for purchase of works by city in 1900 and at intervals of 10 yrs. thereafter. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, pumping from two collecting wells to standpipe, and direct. STAND-PIPE.—Cap., 200,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 11 miles. Taps, 400. Meters, 11. Hydrants, public, 91. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $60,000. Cap. Stock, $60,000. No debt. Expenses, $3,000. Revenue, $5,936: Consumers, $2,300; City, fire protection, $3,636. MANAGEMENT.—Rept. by Supt. and Mgr., John W. Henderson, Sept. 26, '96. SEWERS.—Has sewers.

135. **URBANA,** Champaign Co. (6,510.) Built in '78 by Urbana Water-Works Co. FRANCHISE.—(Second) 10 yrs. from '88. SUPPLY.—Open well and 8 6-in. driven wells, pumping direct. Open well (in '89), 20 x 15 ft. PUMPS.—Cap., 3,500,000 galls.; 2,000,000 Holly-Gaskill hor. high duty; 1,500,000 Holly quadruplex (from '89 Manual). FISCAL YEAR CLOSED Oct. 15. DISTRIBUTION.—Mains, 18 miles. Taps, 875. Services, lead. Meters, 30. Hydrants, public, 137. CONSUMPTION.—(Galls.) av., 800,000. FINANCIAL.—Cost, $175,000. Cap. Stock, $100,000. Bonded debt, $113,000, at 6%. MANAGEMENT.—Prest., C. H. Venner, Boston, Mass.; Secy. and Supt., Chas. Brand; Treas., W. W. Wilson. Rept. by Supt., Nov. 12, '96. REFERENCE.—Eng. News, Feb. 4, '82.

43. **UHRICHSVILLE,** Tuscarawas Co. (3,842.) Supply from Dennison.

136. **VAN WERT,** Van Wert Co. (5,512.) Built in '90-1 by city. SUPPLY.—Nine wells, pumping direct, and to storage reservoir for fire protection. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly hor. dup. Av. cost of coal, $2.30 per short ton. RESERVOIR.—Cap., 3,000,000 galls. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 19 miles. Taps, 700; made by city, free. Services, galv. i.; paid for by property owner. Meters: 7; owned by village and consumer; controlled by village; yearly rental, none. Use of meters compulsory for elevators and motors. City can compel use of meters and any consumer may have one. Hydrants, public, 155. CONSUMPTION.—(Galls.) av., 200,000; max., 275,000; min., 160,000. PRESSURE.—Ordinary, 45 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $130,000. Bonded debt, $130,000: $5,000, at 4½%, due 1910; $50,000, at 5%, due 1921; $70,000, at 5%, due 1941; $5,000, at 5%, due 1905. Expenses, Operating, $4,000; int., $6,475. Revenue: Consumers, unmetered, $4,620; street sprinkling, $120. Deficits of $6,500, met by taxation. MANAGEMENT.—Mayor, C. M. Sutphen; Secy., C. F. Manship; City Treas., H. Butler. Rept. by Supt., L. C. Fox, Aug. 8, '96. SEWERS.—Has storm sewers only.

137. **WADSWORTH,** Medina Co. (1,574.) Owned by R. F. Weaver; built in '80 by Wadsworth Water-Works Co. FRANCHISE.—10 yrs. from '80; extended to '99; does not provide for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes, but receives no compensation for public service. No legal difficulties. SUPPLY.—Three springs, 82 ft. above town, by gravity. DISTRIBUTION.—Mains, 6 miles; cost extensions met by owner of works. Taps, 480; made by owner of works for $1. Services, iron and lead; paid for by consumer. Meters: 4; owned, controlled and repaired by works. Use of meters optional with works. Hydrants, private, 2. PRESSURE.—Ordinary, 40 lbs.; fire, 38 lbs. FINANCIAL.—Cost, $20,000. No debt. MANAGEMENT.—Rept. by owner, R. F. Weaver, June 3, '96. PROJECTED

IMPROVEMENTS.—New pump. SEWERS.—Has partial systems of sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 3, '85.

138. **WAPAKONETA,** Auglaize Co. (3,616.) Built in '95 by city; put in operation in Dec. Engr., Geo. Hornung, Cincinnati. SUPPLY.—Nine 6-in. driven wells, flowing into receiving well, thence pumping direct and to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 McGowan comp. dup. non-cond. Natural gas used; equal to coal at $1.40 per short ton. STAND-PIPE.—Cap., 293,000 galls.; steel, 20 × 125 ft. FISCAL YEAR CLOSED Apr., '96. DISTRIBUTION.—Mains, 9 miles; cost extensions met by general taxation. Taps, 220; made by city, free. Services, galv. i.; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 103. CONSUMPTION.—(Galls.) av., 65,000; max., 360,000; min., 12,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $58,000. Bonded debt, $60,000, at 5%. Expenses, Operating, $800; int., $3,000. Revenue, Consumers, unmetered, $1,650; street sprinkling, $75. MANAGEMENT.—Prest., Henry Moser; Secy., J. Wilson, Jr.; Treas., A. E. Schaffer; Ch. Pump. Engr., Albert Franke. Rept. by Geo. Hornung, Jan., '97. SEWERS.—None.

139. **WARREN,** Trumbull Co. (5,973.) Now owned by Warren Water Co.; built in '86-7 by Saml. R. Bullock & Co., N. Y. City. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city at intervals of 5 yrs. Rates not subject to regulation by city. City to pay $45 each for first 100 hydrants, $35 each for next 25 and additional ones at $25 each, per yr. LEGAL DIFFICULTIES.—Press repts. state city refused to pay hydrant rental, alleging that Co. was not complying with contract provisions for pure, filtered water. Matter finally compromised by addition of filter plant, after which city paid arrears. SUPPLY.—Mahoning River, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Deane comp. non-cond. Bituminous coal used; av. cost, $1.50 per short ton. FILTERS.—Cap., 1,500,000 galls.; Warren. STAND-PIPE.—Cap., 398,000 galls.; iron, 22 × 140 ft. DISTRIBUTION.—Mains, 16½ miles; cost extensions met by earnings. Taps, 656; made by Co. for $1. Services, lead and w. i.; paid for by consumer or owner. Meters: 7; owned, controlled and repaired by Co. Hydrants, public, 117. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 75 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $200,000. Cap. Stock: Authorized, $150,000; all paid-up. Floating debt, $5,000; bonded, $150,000, at 6%, due 1916. Expenses: Operating, $7,500; taxes, $644. Revenue: Consumers, $10,700; City, fire protection, $5,095. MANAGEMENT.—Prest., C. C. Pomeroy; Secy. and Treas., C. E. Kimball, both of New York; Supt., Geo. H. Quinby; Ch. Pump. Engr., H. F. Bostwell. Rept. by H. H. Bowby, June 24, '96. SEWERS.—Has sanitary and storm sewers.

140. **WASHINGTON COURT HOUSE,** Fayette Co. (5,742.) Built in '89 by Washington Water Co. FRANCHISE.—20 yrs. from '90; provides for purchase of works by city after 20 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Press rept. in '94 stated Co. had sued city in U. S. Court for $4,000 back hydrant rental; that city alleged contract called for reserve reservoir, which Co. had failed to build. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington. Hocking run of mine coal used; av. cost, $1.75 per short ton. STAND-PIPE.—Cap., 293,000 galls.; 20 × 125 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 16½ miles; cost extensions met by Co.; city pays rental for extra hydrants. Taps, 500; made by consumer. Services, galv. i.; paid for by consumer. Meters: 500; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for all consumers. Hydrants, public, 136; private, 3. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $150,000. Cap. Stock: Authorized, $150,000; all paid-up. Bonded debt, $125,000, at 6%, due 1910. MANAGEMENT.—Prest., E. Randolph, Tuscon, Ariz. Rept. by Supt., Frank C. Smith, Oct. 20, '96. SEWERS.—None.

P 9. **WAUSEON,** Fulton Co. (2,060.) City hopes to build in '97. Supply, wells, by pumping. Bids for sinking wells to yield 500,000 galls. per day were to be received Aug. 12, '96. Est. cost, $25,000. Repts. by Clk., W. S. Brigham, June 13, and member W.-W. Com., C. E. Guilford, Aug. 31, '96.

141. **WELLSTON,** Jackson Co. (4,377.) Built in '91 by city. Engr. and Contr., Jno. P. Martin, Xenia. SUPPLY.—Raccoon Creek, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). Bituminous coal used; av. cost, $1 per short ton. STAND-PIPE.—Cap., 250,000 galls.; steel, 24 × 75 ft. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 8 miles; cost extensions met by taxes and receipts. Taps, 374; made by consumer for $3. Services, galv. i.; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 80 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $60,000. Bonded debt, $60,000 at 6%, due $2,000 yearly. Annual tax to pay bonds as they fall due. Receipts more than pay operating expenses. MANAGEMENT.—Rept. by E. B. Bingham, Dec. 10, '96. SEWERS.—None.

142. **WELLSVILLE,** Columbiana Co. (5,247.) Built in '81 by city. SUPPLY.—Ohio River, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington dup. (makers rept. double this cap.). RESERVOIR.—Cap., 2,500,000 galls.; 334 ft.

above pumps. DISTRIBUTION.—Mains, 7.5 miles. Taps, 700. Hydrants, 63. PRESSURE.—(In '89.) Ordinary, 100 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $64,890. Bonded debt, $50,000 at 5 and 6%. Expenses, $9,226: Operating, $5,806; int., $3,420. Revenue, Consumers, $6,350. NOTE.—No official rept. since '90-1 Manual. In June, '96, A. C. Fogo was Supt. REFERENCE.—Eng. News, Nov. 18, '82.

143. **WEST CARROLLTON,** Montgomery Co. (360.) Built in '95 by village; put in operation Dec. 1. Engr., Perry Seebold, Dayton. Contrs., Martin & Air, Covington, Ky. SUPPLY.—Two wells, 60 ft. deep (pumping direct?). PUMPS.—Cap., 1,000,000 (?) galls; McGowan dup. high pressure. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by revenue. Taps, 44; made for consumer for $7. Services, 1-in. galv. i.; paid for by property owner from curb. Meters, 0. Hydrants, public, 20; private, 15. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $7,500. Bonded debt, $7,800, at 6%; due 1908 and thereafter in sums of $1,000 yearly. Sinking fund will be established after Apr. 1, '97. Expenses, $768: Operating, $300; int., $468. MANAGEMENT.—Prest. and Supt., Geo. W. Deemer; Secy., W. F. Engel; Treas., Jas. B. Shannon; Ch. Pump. Engr., J. H. Wood. Rept. by Supt., Dec. 29, '96. SEWERS.—None.

80. **WEST CLEVELAND,** Cuyahoga Co. Now part of Cleveland, which see.

P 10. **WESTERVILLE,** Franklin Co. (1,329.) Town has employed Engr. to est. cost of water and electric light plant. Bonds not voted yet. Rept. by Mayor, G. L. Stoughton, Feb. 10, '97.

27. **WESTWOOD,** Hamilton Co. (1,050.) Now part of Cincinnati, which see.

144. **WILLOUGHBY,** Lake Co. (1,219.) Built in '92 by city; put in operation Jan. 1, '93. Engr., J. B. Strawn, Salem. Contr., J. W. Newcomber, Mentor. SUPPLY.—Well about 50 ft. from East branch Chagrin River, by pumping. PUMP.—Cap., 40,000 galls.; Hughes. Natural gas used. RESERVOIR.—Cap., 880,000 galls.; storage. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 5 miles; cost extension met by revenue. Taps, 250; made by city for $2. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 47. CONSUMPTION.—(Galls.) av., 160,000; max., 240,000; min., 120,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $31,000. Bonded debt, $30,000, at 5%; due from 1 to 20 yrs. Expenses: Operating, $1,000. Revenue, $1,800; street sprinkling, free; public buildings, free. Interest on bonds met by general taxation. MANAGEMENT.—Prest., A. P. Barlen; Secy., C. C. Jenkins; Treas., G. E. Manville; Supt., A. P. Barlen; Ch. Pump. Engr., Ed. Baker. Rept. by Supt., Aug. 29, '96. SEWERS.—None. REFERENCE.—Eng. News, Jan. 26, '98.

145. **WINTON PLACE,** Hamilton Co. (Est., 822.) Built in '96 by village. Engr., Chas. A. Ewing, Carlisle Bldg., Cincinnati. Contr., John Snyder, Norwood. City of Cincinnati operates works. Village pays $10 per hydrant per yr., and consumers pay 10% over Cincinnati city rates. SUPPLY.—Cincinnati works. DISTRIBUTION.—Mains, 6¼ miles; cost extensions met by 20 to 30 yr. bonds, at 5%. Services paid for by consumer. Meters, 0. Hydrants, public, 46; private, 2 or 3. PRESSURE.—Ordinary, 50 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $22,500. Bonded debt, $25,000, at 5%; due 20 to 30 yrs. No sinking fund. Expenses: Int., $1,200 and $460 for hydrants, raised by taxes. MANAGEMENT.—Chn., A. G. Moore. Rept. by R. B. Poage, Vill. Clk., June 15, '96. SEWERS.—None.

146. **WOOSTER,** Wayne Co. (5,901.) Built in '69 by town. SUPPLY.—Springs and well, by gravity from former, by pumping from latter. Oct. 17, '94, Jas. D. Beer, Chn. Water Extension Com., rept. that addition to supply was under investigation; Engr., Minor Scovel. PUMP.—Cap., 750,000 galls.; Worthington simple high pressure. RESERVOIR.—Cap., 12,000,000 galls.; two 6,000,000. DISTRIBUTION.—Mains, 11 miles. Taps, 250. Meters, 7. Hydrants, 105. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $115,000. Expenses, $2,400: Operating, $1,600; int., $800. Revenue: Consumers, $2,840. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, June 17, '82.

147. **WYOMING.** Hamilton Co. (1,454.) Built in '92 by village; put in operation Jan. 1, '93. Engr., E. F. Layman, Cincinnati. SUPPLY.—Wells, 150 ft. deep, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon Co. Youghiogheny bituminous nut and slack used; av. cost, $1.57 per short ton. RESERVOIR.—Cap., 3,000,000 galls.; one mile from wells. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 8 miles. Taps, 160; made by village. Services, lead; paid for by property owner. Meters, 2; owned by property owner; controlled by village. Village can compel use of meters and any consumer may have one. Have adopted the meter system entirely, to go into effect during this year. Hydrants, public, 45; private, 2. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $43,000. Expenses: Operating, $2,770; int., $2,150. Revenue, $5,000. MANAGEMENT.—Prest., S. Whinery; Secy., W. A. Clark; Treas., A. A. Taylor; Supt., W. A. Clark; Ch. Pump. Engr., W. W. Ellis. Rept. by Supt., June 15, '96.

148. **XENIA,** Greene Co. (7,301.) Built in '87 by Xenia Water-Works Co. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city in '97 or 1907. Rates fixed in franchise. Co. is not exempt from local taxes. City to pay $7,500 per yr. for

200 hydrants; additional ones at $35 each. No legal difficulties. SUPPLY.—Springs and wells. pumping from reservoir to stand-pipe. PUMPS.—Cap., 5,000,000 galls.; 2—1,750,000 Gordon & Maxwell; 1,500,000 Deane comp. dup., added in '96. Jackson run of mine bituminous coal used; av. cost, $2.35 per short ton. RESERVOIR.—Cap., 3,500,000 galls.; area, about 1 acre. STAND-PIPE.—Cap., 275,000 galls.; iron; 20 × 115 ft. FISCAL YEAR CLOSED Aug. 1. DISTRIBUTION.—Mains, 24 miles; cost extensions met by income. Taps, 800; made by Co. at property owner's expense. Services, galv. i.; paid for by property owner. Meters, 30; owned, controlled and repaired by Co. Use of meters compulsory for hotels and manufacturers. Co. cannot compel but can prohibit the use of meters. Hydrants, public, 184. CONSUMPTION.—(Galls.) av., 300,000; max., 800,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost (in '90), $205,000. Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $150,000, at 6%. No sinking fund. MANAGEMENT.—Prest., John Little; Secy. and Supt., Geo. F. Cooper; Treas., D. Birnie, Springfield, Mass.; Ch. Pump. Engr., John Masters. Rept. by Supt., June 4, '96.

149. **YOUNGSTOWN,** Mahoning Co. (33,220.) Built in '72 by city. SUPPLY.—Mahoning River, through intake to pump wells, pumping to stand-pipes. PUMPS.—Cap., 8,000,000 galls.: 3,000,000 Worthington non-comp. non-cond.; 5,000,000 Deane. Bituminous nut and slack coal used; av. cost, $1.10 per short ton. STAND-PIPES.—Cap., 1,060,000 galls.; 2—530,000; steel; 30 × 100 ft. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 47 miles; cost extensions met by revenue. Taps, 2,599; made by city for $1. Services, lead; paid for by consumer. Meters, 200; owned, controlled and repaired by city. Use of meters not optional with consumer; compulsory for blacksmiths, manufacturers, R. Rs., livery stables and restaurants. Hydrants, 447. CONSUMPTION.—(Galls.) av., 2,415,283. PRESSURE.—(In '89.) Ordinary, 85 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $478,503. Debt, $295,000: Floating, $35,000. Bonded, $260,000, at 5%; $100,000 due in 1901 and $160,000 in '96 to 1906. Expenses: Operating, $15,409. Revenue: Consumers, $41,497. MANAGEMENT.—Prest., J. H. Morris; Secy., D. N. Simpkins; County Treas., R. T. Johnston; Supt., W. S. Hamilton; Ch. Pump. Engr., Chris. Ludt. Rept. by Secy., June 15, '96. PROJECTED IMPROVEMENTS.—Two 5,000,000-gall. pumping engines, 2—200 HP. Scotch marine boilers and rebuilding of engine house. SEWERS.—Has storm sewers. REFERENCE.—Eng. News, Dec. 23, '82.

150. **ZANESVILLE,** Muskingum Co. (21,009.) Built in '42 by town. SUPPLY.—Muskingum River, pumping to stand-pipe and distributing reservoir. PUMPS.—Cap., 10,000,000 galls.: 5,000,000 Holly-Gaskill hor. high duty; 2,000,000 Gordon; 3,000,000 Worthington comp. cond. Press rept., Sept. 24, '96, stated city had just received alternative bids on 2—6,000,000 and 2—8,000,000 pumps. Bituminous slack used; av. cost, 75 cts. per short ton. RESERVOIRS.—Cap., 4,500,000 galls.; 2,500,000 and 2,000,000. STAND-PIPE.—Cap., 367,000 galls.; steel; 25 × 100 ft., on hill above reservoirs. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 64 miles; cost extensions met by revenue. Taps, 5,429; made by city for $1.50. Services, lead and iron; paid for by property owner. Meters, 35; owned, controlled and repaired by city. Use of meters optional with city; compulsory for manufacturers. Hydrants, public, 285. CONSUMPTION.—(Galls.) av., 3,915,430. PRESSURE.—Ordinary, 60 to 120 lbs. FINANCIAL.—Bonded debt, $380,000, at 4 and 5%. Expenses: Operating, $9,000. Revenue: Consumers, $34,664. MANAGEMENT.—Prest., A. Kimble; Secy., Theo. D. McCaddon; Treas., Jesse Frazier; Supt., F. Haehulen; Ch. Pump. Engr., H. Hubbell. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 26, '81.

INDIANA.*

1. **ALBION,** Noble Co. (1,229.) Built in '96 by city (see footnote); put in operation Mar. 1. Engrs., Howe Pump & Engine Co., Indianapolis; Contr., C. L. Olds, Fort Wayne. SUPPLY.—Driven wells, pumping direct. PUMP.—Cap., 1,000,000 galls.; 2—500,000 Worthington comp. non-cond. Av. cost of coal used, $2.60 per short ton. DISTRIBUTION.—Mains, 8 miles. Taps, 56; made by city for $7.50. Services, iron; paid for by consumer. Meters, none. Hydrants, public, 22. PRESSURE.—Ordinary, 40

*Under legislation of '93 and '95 municipalities in this State may own or control waterworks through the agency of a company in which they own stock. This is intended to facilitate the construction of works under municipal control, where the 2% bonded indebtedness limit renders ordinary city ownership impossible. It is said to be important that contractors and supply men, operating in Indiana, bear the above in mind, as where this plan prevails bills come under lien law, while in case interest on bonds is not paid, bondholders may foreclose on plant. Mr. John J. Hainsworth, Consult. Engr., Franklin, Ind., states in a letter dated Jan. 1, '97, that the following works come under above plan (some on account of extensions?), and perhaps others: Albion, Attica, Decatur, Fowler, Garrett, Hammond, Huntington, Monticello, Portland, Rushville and Sullivan. He also states that Iowa and Wisconsin passed similar laws in '95, but so far as he knows, nothing has yet been done under them.

lbs., fire, 100 lbs. FINANCIAL.—Cost of combined water and light plants, $30,000. MANAGEMENT.—Supt., D. L. Baughman; Ch. Pump. Engr., Chas. Ingraham. Rept. by Supt., Nov. 16, '96. SEWERS.—None.

2. **ALEXANDRIA,** Madison Co. (715.) Built in '95 by city; put in operation Dec. 1. Contrs., Seckner Contracting Co. SUPPLY.—Four 8-in. wells, pumping to standpipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Smith-Vaile and Stilwell-Bierce Co. Gas used. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft.; steel. DISTRIBUTION.—Mains, 7 miles. Taps, 117; made by city for $5.50. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 68. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Contract price, $46,713. MANAGEMENT.—Prest., A. E. Harlan; Secy. and Supt., H. T. Ireland; Treas., J. F. Brenaman; Ch. Pump. Engr., D. B. Spence. Rept. by Secy., June 15, '96. PROJECTED IMPROVEMENTS.—Reservoir for a reserve supply. SEWERS.—None.

3. **ANDERSON,** Madison Co. (10,741.) Built in '86 by town. SUPPLY.—White River, pumping direct. PUMPS.—Cap., 8,000,000 galls.; Hughes comp. cond. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 19 miles. Taps, 1,200; made by city for $5. Services, galv. i.; paid for by property owner from curb. Meters, 4; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for Ry. Hydrants, public, 149; private, 13. CONSUMPTION.—(Galls.) av., 2,500,000; max., 8,000,000; min., 2,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 to 100 lbs. FINANCIAL.—Cost, $150,000. Expenses, Operating, $4,700. Revenue, Consumers, $7,878. MANAGEMENT.—Chn., Laf. J. Burr; Secy., Jas. T. Knowland; Treas., Chas. Remery; Supt., S. A. Towell; Ch. Pump. Engr., Henry Drach. Rept. by Supt., June 11, '96. SEWERS.—Has sanitary and storm sewers.

4. **ANGOLA,** Steuben Co. (1,840.) Built in '95 by Croxton, Kinney & Pilliod; put in operation July 6. Engrs. and Contrs., Holly Mfg. Co., Lockport, N. Y. FRANCHISE.—20 yrs. from 1895. Rates are subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Wells, pumping direct. PUMPS.—Cap., 3,000,000 galls.; Holly vert. triple exp. Jackson Hill bituminous coal used; av. cost, $2.36 per short ton. DISTRIBUTION.—Mains, 6 miles; cost extensions met by city. Taps, 239; made by consumer at $5.75 for ¾-in. Services, galv. i.; paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 350,000; max., 650,000; min., 225,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $35,000. Revenue: Consumers, $2,100; street sprinkling, $100. MANAGEMENT.—Supt., P. A. Croxton; Ch. Pump. Engr., C. V. Pilliod. Rept. by Supt., June 16, '96. SEWERS.—Has sanitary and storm sewers.

5. **ATTICA,** Fountain Co. (2,320.) Built in '73-4 by town (see foot note, page 318). SUPPLY.—Springs, pumping to reservoir. PUMPS.—Cap., 2,500,000 (?) galls.; 2—500,000 Deane; makers rept. 2—750,000 Worthington vert. comp. cond. RESERVOIR.—Is 20 × 40 ft. and 300 ft. above pumps. DISTRIBUTION.—Mains, 7 miles. Taps, 330. Meters, 1. Hydrants, 7. Press rept. states that 5 miles of mains and 24 hydrants were added in '94. FINANCIAL.—Cost, $50,000. Bonded debt, $10,000, at 6%. Expenses, $2,100: Operating, $1,500; int., $600. Revenue, Consumers, $1,650. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Sept. 22, '83.

P 1. **AURORA,** Dearborn Co. (3,929.) Jan. 13, '97, Alex. Potter, 137 Broadway, New York, rept. that in '95 he designed works and that recent advices indicate that works will be built in '97. J. J. Brackman is rept. as Clk.

6. **AVILLA,** Noble Co. (576.) Built in '90 by town. SUPPLY.—Source not given, pumping to tank. PUMPS.—Cap., 18,720 galls.; Henion & Hubbell. TANK.—Cap., 16,000 galls. DISTRIBUTION.—Mains, ½ mile. Taps, 6. Hydrants, 6. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $2,800. Bonded debt, $1,800 at 6%. NOTE.—No rept. since '90-1 Manual.

7. **BEDFORD,** Lawrence Co. (3,351.) Built in '93 by city. Press rept. states city paid Contrs. $5,000 down and that latter took mortgage on plant to secure deferred payments to extend over 10 yrs. SUPPLY.—By pumping. PUMPS.—Cap., 2,000,000 galls.; a dup. and a comp. dup. Deane, erected in '92 (rept. by makers). FINANCIAL.—Cost, about $65,000 (press rept.). MANAGEMENT.—Cy. Clk., W. M. Denniston.

—? **BLOOMINGTON,** Monroe Co. (4,018.) Put under construction in '92 or '93 by Bloomington Water-Works Co. Contrs., C. E. Coon & Co., Toledo, O. LEGAL DIFFICULTIES.—Late in '93, city passed resolution annulling franchise, on grounds that Co. had not complied with it. In or about '95 receiver was appointed. Aug. 19, '96, property was sold, to satisfy Contrs. liens, to Wm. N. Showers. Press rept., Oct. 14, '96, states court set aside sale, on representations that city had annulled franchise in order to get possession of plant at low figure; also that court ordered framing of issue to test validity of franchise. SUPPLY.—Impounding reservoir, fed by two springs (pumping direct ?). PUMPS.—Smith-Vaile. DISTRIBUTION.—Mains, 6 miles. Taps, 160. Use of meters optional with consumer. Hydrants, public, 70. MANAGEMENT.—Rept. by H. A. Woolery, Receiver. SEWERS.—None.

8. **BLUFFTON,** Wells Co. (3,589.) Built in '86 by town. SUPPLY.—Driven wells for domestic supply, and Wabash River for fire protection, direct pumping from receiv-

ing reservoir. There are 12 driven wells, 200 ft. in rock, near river, from which water is lifted to reservoir. A 16-in. pipe connects river with reservoir for emergency use. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup.; also 10 × 36-in. Cook, pumping from well, 180 ft. deep. RESERVOIR.—Cap., 754,000 galls.; at pumping station. DISTRIBUTION.—Mains, 10 miles. Meters, 12. Hydrants, public, 75. FINANCIAL.—Cost, $30,000. Expenses, $2,000. Revenue, Consumers, unmetered, $3,500. MANAGEMENT.—City Council. Supt., W. B. De Haven. Rept. by Asst. Supt., Lew. De Haven, Sept. 25, '96.

9. **BOONVILLE,** Warrick Co. (1,881.) Built in '96 by Boonville Water-Works Co. and leased to town, the latter taking $10,000 worth of stock; put in operation Aug. 10. Engr., A. H. Kenedy, Rockfort. Contr., Frank Schefold, New Albany. FRANCHISE.—20 yrs. from '96; provides for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artificial reservoir, pumping to tank and, in case of fire, direct. PUMP.—Cap., 1,000,000 galls.; McGowan dup. high pressure. TANK.—Cap., 110,000 galls.; iron, 25 × 32 ft., on iron trestle; total height, 113 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 100; made by consumer. Services paid for by owner. Use of meters compulsory for mills and livery stables. Hydrants, public, 35. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $31,000. Cap. Stock: Authorized, $30,000. Debt, $30,000 at 6%. Expenses, int., $1,800. MANAGEMENT.—Prest., Clem. Pelzer; Secy., C. C. Ferguson; Treas., John C. Shafer; Ch. Pump. Engr., C. Katterjohn. Rept. by Secy., Jan. 1, '97. SEWERS.—None.

10. **BORDEN,** Clark Co. (Not given.) Built in '94 by Co.; put in operation Aug. 23. Engr., Nat. Morrill, New Albany; Contr., Alfred Walker, New Albany. FRANCHISE.—25 yrs. from '94. No compensation for public service. SUPPLY.—Surface well, pumping to reservoir. PUMPS.—Cap., 216,000 galls.; Deane dup. Bituminous slack used; av. cost, $2.20 per short ton. RESERVOIR.—Cap., 150,000 galls.; storage. FISCAL YEAR CLOSED Aug. 23. DISTRIBUTION.—Mains, 2,800 ft.; cost extensions met by earnings. Taps, 15; made by Co. Services, iron; paid for by consumer. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 2,500; most water is used by R. R. PRESSURE.—Fire, 112½ lbs. FINANCIAL.—Cost, $3,600. Cap. Stock (paid-up), $3,200; paid no div'd last yr. Expenses, Operating, $200. Revenue, City, none. MANAGEMENT.—Prest., W. W. Borden; Secy., G. E. Jenkins; Treas., H. Shoemaker; Supt., G. W. Miller; Ch. Pump. Engr., Wm. McKinley. Rept. by H. A. Buerk, Sept. 1, '96. SEWERS.—None.

P 2. **BOURBON,** Marshall Co. (1,064.) Press repts., Jan., '97, stated Trustees were considering works, but had done nothing definite. Cy. Clk., J. W. Plant.

11. **BRAZIL,** Clay Co. (5,905.) Built in '75 by town. SUPPLY.—8-in. driven well, pumping direct. PUMPS.—Cap., 4,600,000 galls.; two Deane dup. comp. cond., erected in '95. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 9 miles; cost extensions met by bonds. Taps, 300; made by city, free. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 85. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 80 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $125,000. Expenses, Operating, $4,000. Revenue: Consumers, $300; other purposes, $4,000. MANAGEMENT.—Supt., O. C. Hawkins; Ch. Pump. Engr., Elmer Shaw. Rept. by Supt., June 5, '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Feb. 23, '84.

12. **BREMEN,** Marshall Co. (1,076.) Built in '92 by town; put in operation in Aug. Engr., Geo. C. Morgan, Chicago. Contr., James Madden, Fort Wayne. SUPPLY.—Artesian well, pumping to tank. There are two 4-in., five 2-in., and two 6-in. wells. PUMPS.—Cap., 1,350,000 galls.; 600,000 Hughes, high pressure; 750,000 Worthington, comp. non-cond. Operated in connection with electric light plant. Wood used. TANK.—Cap., 30,000 galls.; steel; 12 × 36 ft., in brick tower, 13 × 68 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 3 miles; cost extensions met by taxation. Taps, 300; made by town for $7, including service to curb. Services, w. i.; paid for by consumer from curb. Meters, 0. Town can compel use of meters, and consumer may have one. Hydrants, public, 22; private, 5. CONSUMPTION.—(Galls.) av., 350,000; max., 550,000; min., 200,000. PRESSURE.—Ordinary, 42 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $15,500. Bonded debt, $8,000, at 6%; due 1905. Sinking Fund, none. Expenses, Operating, $700. Revenue, Consumers, unmetered, $850. Deficits: Int. paid by special tax levy if necessary. MANAGEMENT.—Prest., G. F. Wahl; Secy., W. F. Mensel; Treas., E. G. Fisher; Supt., T. F. Knoblock; Ch. Pump. Engr., John Foltz. Rept. by Supt., Aug. 31, '96. SEWERS.—None.

13. **BRIGHTWOOD,** Marion Co. (1,387.) Built in '95 by town; put in operation in June. Des. Engrs., Alvord & Shields, The Rookery, Chicago; Contrs., U. S. Wind Engine Co., Batavia, Ill. SUPPLY.—Deep wells, pumping direct. PUMPS.—Cap., 1,250,000 galls.; 500,000 and 750,000 Worthington comp. non-cond. and simple high pressure, respectively. Natural gas used; cost $36 per mo. DISTRIBUTION.—Mains, 5 miles; cost extensions met by city. Taps, 130; made by city for $8. Services, galv. i.; paid for by property owner. Hydrants, public, 42. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 20 to 30 lbs.; fire, 80 (?) lbs. FINANCIAL.—Cost, $22,000. Bonded debt, $18,000, at 6%; due, $4,000 in 1900 and 1905, and $5,000 in 1910 and 1915. Expenses: Operating, $1,425; int., $1,080. MANAGEMENT.—W.-W. Com., J. J. Stevens,

H. A. Hodson, Jno. L. White. Rept. by Town Clk., J. J. Valdenaire, Jan. 4, '97, and F. A. W. Davis, Indianapolis, Feb. 5, '97. SEWERS.—Has storm sewers only.

14. **BROOKVILLE,** Franklin Co. (2,028.) Built in '92 by town; put in operation July 14. Engr., John Burkhardt. Contr., Thos. A. Hardman, Olney, Ill. SUPPLY.—Two large open wells in gravel on bank of White Water River, pumping to reservoir and direct. PUMPS.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon comp. dup. Av. cost of coal used, $3.00 per short ton, delivered. RESERVOIR.—Cap., 375,000 galls.; distributing 152 ft. above nozzle of highest fire hydrant. FISCAL YEAR CLOSED July 14, '95. DISTRIBUTION.—Mains, 5.6 miles; cost extensions met by tax. Taps, 318; made by town, free, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters: 4; owned, controlled and repaired by town. Use of meters compulsory for motors, market-gardens and consumers outside of corporate limits. Hydrants, public, 43. CONSUMPTION.—(Galls.) av., 135,000; max., 250,000; min., 50,000. Town can compel use of meters and any consumer may have one. PRESSURE.—Ordinary, 66 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $26,000. Bonded debt, $20,000, at 5%. Sinking Fund: $575, not invested. Expenses, Operating, $1,335. Revenue, Consumers, unmetered, $1,663; metered, $182. MANAGEMENT.—Prest. Town Bd., M. C. Armstrong; Clerk, Ira Wilson; Treas., Phil R. Hendrickson; Supt., Jno. Burkhart; Ch. Pump. Engr., William Burkhart. Rept. by Supt., June 15, '96. SEWERS.—None.

15. **BUTLER,** De Kalb Co. (2,521.) Built in '90 by town. FRANCHISE.—20 yrs. from '91. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 500,000 galls.; 2—250,000 Hughes. Bituminous lump coal used. FISCAL YEAR CLOSED Apr. 24, '96. DISTRIBUTION.—Mains, 3½ miles. Taps, 127; made by licensed plumber for $1. Services paid for by town. Meters, 0. Hydrants, public, 48. CONSUMPTION.—(Galls.) av., 200,000; max., 400,000; min., 93,500. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $20,000. Floating debt, $2,500; bonded, $16,000 at 6%, due $1,000 yearly. Sinking Fund, $1,400. Expenses: Operating, $2,800; int., $1,000. MANAGEMENT.—Prest., Wm. Mutzfeld; Secy., H. Wanamaker; Treas., L. C. Harding; Ch. Pump. Engr., J. W. Brown. Rept. by Secy., Jan. 4, '97. SEWERS.—None.

16. **CAMBRIDGE CITY,** Wayne Co. (1,782.) Built in '95 by town. Des. Engrs., Voorhees & Witmer, Buffalo, N. Y. Constr. Engr., Toney C. Hefel, Muncie. SUPPLY.—Well (press rept.), pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Hughes. RESERVOIR.—Near pumping station, for reserve. FINANCIAL.—Cost, probably about $25,000, as this amount of bonds was voted by people, and at 6%, was offered for sale Nov. 1, '94. MANAGEMENT.—Rept. by Town Clk., C. H. Tabke, in '94, and from Des. Engr., makers of pump, official advertisement and press repts.; subject to revision.

— ? **CANNELTON,** Perry Co. (1,991.) Built in '93 by Cannelton Water-Works Co. Press rept., Jan. 16, '97, stated works had been sold for $6,000 to satisfy judgment held by Union Trust Co., of Philadelphia.

17. **COLUMBIA CITY,** Whitley Co. (3,027.) Built in '93 by city; put in operation Jan. 1, '94. Engrs., Voorhees & Witmer, Buffalo, N. Y. Contrs., Grimes & Moran, Elkhart. SUPPLY.—Three flowing wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. Parke County bituminous coal used; av. cost, $2.50 per short ton. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 7 miles; cost extensions met by city warrant. Taps, 250; made by consumer. Services, lead; paid for by consumer. Meters, 10; owned and repaired by consumer. Use of meters optional with consumer. Hydrants, public, 76. One steam fire engine held in reserve. FINANCIAL.—Cost, $32,000. Floating debt, $700, at 6%; bonded, $22,000, at 6%. No sinking fund. Expenses: Operating, $3,500. Revenue, $3,066. MANAGEMENT.—Prest., Geo. W. North; Treas., F. G. Binder; Supt., J. A. Ruch. Rept. by F. M. Douglas, Clk., June 16, '96. SEWERS.—Has 2 miles of storm sewers.

18. **COLUMBUS,** Bartholomew Co. (6,719.) Built in '71 by town. SUPPLY.—Driftwood River, pumping direct. PUMPS.—Cap., 4,500,000 galls.; 1,000,000 Holly hor. dup.; 3,000,000 Holly-Gaskill hor. high duty. DISTRIBUTION.—(In '88.) Mains, 11 miles. Taps, 400. Hydrants, public, 70. FINANCIAL.—(In '88.) Cost, $52,000. Expenses, $5,000. Revenue, $5,300. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Oct. 8, '81.

19. **CONNERSVILLE,** Fayettte Co. (4,548.) Built in '69 by city. SUPPLY.—Cincinnati & Hagerstown Canal, and from river, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,000,000 Root rotary water power and 1,000,000 Holly quadruplex steam for emergency. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 10 miles; cost of extensions met by city. Taps, 500; made by consumer for $9. Services, lead; paid for by consumer. Meters, 0. Use of meters optional with city. Hydrants, public, 160. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $100,000. Bonded debt, $30,000, at 6%. No sinking fund. Expenses: Operating, $1,900. Revenue: Consumers, unmetered, $2,800. Deficits of $1,000 are met by taxation. MANAGEMENT.—Rept. by L. A. Frazer, Fire Chief, July 13, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, May 27, '82.

20. **CONVERSE,** Miami Co. (Not given.) Built in '95 by town; put in operation July 1. Engr., C. M. Blue. Contr., Reuben Murphy. SUPPLY.—Drilled wells, pumping

to tank. PUMP.—Cap., 400,000 galls.; Deane. Natural gas used; cost, $54 per yr. TANK.—Cap., 81,500 galls.; wood; 8½ × 70 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 2½ miles. Taps, 80; made by town for $2. Services, galv. i.; paid for by consumer. Town cannot compel but may prohibit use of meters. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 63,000; max., 94,500. PRESSURE.—Ordinary, 31 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $11,000. Bonded debt, $8,900, at 6%. Sinking Fund, none. Expenses: Operating, $600; int., $540. Revenue: Consumers, unmetered, $800. Deficit, $900. MANAGEMENT.—Prest., Geo. W. Day; Secy., Treas. and Supt., C. M. Blue; Ch. Pump. Engr., Jasper Barron. Rept. by Secy., Aug., '96. SEWERS.—Has storm water sewers.

21. **COVINGTON,** Fountain Co. (1,891.) Built in '92. Contrs., W. S. Reed & Co., Chicago. SUPPLY.—By pumping. PUMPS.—1,700,000 galls.; two Deane comp. dup., erected in '92 (rept. by makers).

22. **CRAWFORDSVILLE,** Montgomery Co. (6,089.) Built in '86 by Crawfordsville Water-Works Co., which reorganized in '95 as Crawfordsville Water & Light Co. Now controlled by bondholders (who foreclosed mortgage on plant in '94), with W. G. P. Coffin as Prest. FRANCHISE.—20 yrs. SUPPLY.—Springs and artesian wells, pumping direct and to stand-pipe. PUMPS.—Cap., 4,000,000 galls.; 2—1,500,000 comp. non-cond. and 1—1,000,000 non-comp. non-cond. Worthington. RESERVOIR.—Cap., 1,000,000 galls.; impounding. DISTRIBUTION.—Mains, 15 miles. Taps, 1,015. Services, w. i. Meters, 39. Hydrants, public, 146. PRESSURE.—(In '89.) Ordinary, 110 lbs; fire, 130 lbs. FINANCIAL.—(In '90.) Cost, $425,000. Cap. Stock, paid up, $300,000. Bonded debt, $300,000, at 6%. Expenses, $36,600: Operating and taxes, $12,600; int., $18,000. Revenue, $43,930: Consumers, $29,000; Ry., $4,100; City, fire protection, $10,830. MANAGEMENT.—Gen. Mgr., Percy C. Hord; Ch. Pump. Engr., Edgar L. Street. General office, 606 Corn Exchange Bldg., New York. Local Mgr., A. S. Reed. SEWERS.—Has sewers.

23. **CROWN POINT,** Lake Co. (1,907.) Built in '96 by town; put in operation about Feb. Contrs., Seckner Contracting Co., Chicago, Ill. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Smith-Vaile dup. Bituminous slack and nut coal used; av. cost, $2.25 per short ton. STAND-PIPE.—Cap., 84,000 galls.; iron; 12 × 100 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 75; made by town for $8.00 to $10.00. Services, lead; paid for by consumer. Meters: 0. Use of meters compulsory for R. R., mfg. plants and laundries. Town can compel use of meters and any consumer may have one. The charge for water by meter cannot be less than by regular schedule. Hydrants, public, 45. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $42,650. Bonded debt, $37,500, at 6%; due at intervals for 22 yrs. MANAGEMENT.—Ch. Pump. Engr., Frank Metzler. Rept. by C. W. Allman, Sept. 1, '96. SEWERS.—Has storm sewers only.

24. **DANVILLE,** Hendricks Co. (1,569.) Built in '92 by town. Engr., M. Sturtevant, Chicago, Ill. Contr., Chas. F. Toben, Hillsboro, Ill. SUPPLY.—Driven wells, pumping to stand-pipe. PUMP.—Cap., 570,000 galls.; Deane comp. dup. Bituminous slack used; av. cost, $1.15 per short ton. STAND-PIPE.—Cap., 84,600 galls.; steel; 12 × 100 ft. DISTRIBUTION.—Mains, 4 miles. Services, galv. i.; paid for by property owner. Meters: 4; owned and controlled by town; yearly rental, none. Use of meters compulsory for liveries, barns and street sprinklers. Town can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 198,000; min., 98,000. FINANCIAL.—Cost, $29,000. Bonded debt, $19,000, at 5%; due 1916 and thereafter, $1,000 per yr. No sinking fund. Expenses: Operating, $850; int., $950. Revenue, $1,940: Consumers, $1,100; public buildings, $240; R. R., $600. MANAGEMENT.—Prest., James A. Downard; Treas., Scott L. McCarty. Rept. by A. H. McLean, Cy. Clk., Aug. 1, '96. SEWERS.—None.

25. **DARLINGTON,** Montgomery Co. (461.) Built in '95 by Darlington Water-Works Co.; put in operation Sept. 1. FRANCHISE.—50 yrs. from '95. No legal difficulties. SUPPLY.—Wells, pumping direct. PUMP.—Cap., 350,000 galls.; Dean Bros. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 3 miles; cost extensions made from net earnings. Taps, 100; made by Co., free. Services, ¾-in.; paid for by Co. Meters, 0. Use of meters optional with Co. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 25,000; max., 50,000; min., 10,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $4,000. Expenses: Operating, $500. MANAGEMENT.—Prest., V. E. Craig; Secy. and Treas., Jas. A. Peterson; Supt., A. H. Bowers; Ch. Pump. Engr., Jas. H. Chesterson. Rept. by Co., Sept. 1, '96. SEWERS.—None.

26. **DECATUR,** Adams Co. (3,142.) Built in '94-5 by city (see footnote p. 318); put in operation Feb. 28. Engr., J. D. Cook, Toledo, O. Contrs., Howe Pump & Engine Co., Indianapolis. SUPPLY.—Eight driven wells, 6-in. diam., 250 ft. deep, pumping to storage well, thence pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. and Pohle air lift. Natural gas used; cost, $45 per month. City is allowed use of gas at this rate in consideration of exempting gas co. from taxation; would otherwise cost double the amount. STORAGE WELL.—Cap., 137,000 galls.; brick with slate roof. DISTRIBUTION.—Mains, 12 miles; cost extensions met by city treasury. Taps, 240; made by city for $2, including lead service to curb. Services, lead or iron;

paid for by property owner from curb. Meters: 1; owned and repairs paid for by consumer. Use of meters optional with consumer. Hydrants, public, 92. CONSUMPTION.—(Galls.) av., 60,000; max., 75,000; min., 45,000. PRESSURE.—Ordinary, 45 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $66,000. Floating debt, $54,000, at 6%. No sinking fund. Expenses: Operating, about, $1,525; Revenue: Consumers, about, $1,200. First fiscal year closes Mar. 1, '97; above expenses and revenue are estimated. MANAGEMENT.—Mayor, B. W. Quinn; Clerk, Albert Brittson. Rept. by Cy. Engr. and Supt., John W. Tyndall, Dec. 15, '96. SEWERS.—Has combined sanitary and storm sewers.

27. **DELPHI,** Carroll Co. (1,923.) Owned by city, built in '91-2 by Delphi Water Co., which immediately deeded plant to city, subject to mortgage. Engr. and Contr., Geo. C. Morgan, Chicago. SUPPLY.—Spring, by gravity, with pumping to tank and direct in case of fire. PUMPS.—Cap., 1,000,000 galls.; two Deane dup. (rept. by makers). TANK.—Cap., 27,000 galls.; 11 ft. 7 ins. × 36 ft., on brick tower. DISTRIBUTION.—Mains, 4 miles. Hydrants, 40. FINANCIAL.—Cost, $38,648. Bonded debt, $36,000 bonds issued by Co., but payable by city. MANAGEMENT.—Com. Information from local press description on completion of plant, Jan., '92; hence subject to revision.

28. **DUNKIRK,** Jay Co. (1,024.) Built in '94 by city; put in operation in Sept. Engrs. and Contrs., Howe Pump & Engine Co., Indianapolis. SUPPLY.—Wells, pumping direct. PUMPS.—Cap., 500,000 galls. Natural gas used; av. cost, $180 per year. DISTRIBUTION.—Mains, 5 miles; cost extensions met by levy on general tax. Taps, 225; made by consumer for $5.75. Services, w. i. and lead; paid for by consumer. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 2,500. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $18,000. Floating debt, $6,000; bonded, $12,000, at 6%, $500 due yearly until paid. Expenses: Operating, $1,600; int., $720. MANAGEMENT.—Prest., J. B. Mendenhall; Secy., Andrew J. Bates; Treas., B. P. Hunt; Supt., J. O. Sullivan; Ch. Pump. Engr., Dan'l W. Bainey. Rept. by Treas., Nov. 19, '96. SEWERS.—Has sanitary sewers.

29. **EAST CHICAGO,** Lake Co. (1,255.) Built in '94 by city; put in operation Nov. 1. Becomes property of the East Chicago Water-Works Co. in case city fails to meet bonds. Engrs. and Contrs., Seckner Contracting Co. FRANCHISE.—20 yrs. from '94. Works purchased by city in Nov., '94. Rates are fixed in franchise and subject to regulation by city council. SUPPLY.—Lake Michigan, 3¾ miles from city, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Stilwell-Bierce & Smith-Valle Co. Bituminous coal used; av. cost, $1.55 per short ton. STAND-PIPE.—Cap., 150,400 galls.; 16 × 100 ft.; on stone foundation. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 14 miles. Taps, 450; made by city for $2.50. Services, ¾-in. lead; paid for by owner of property. Meters: 10; owned and repaired by consumer; controlled by city. Use of meters compulsory for factories and R. R. City can compel use of meters and any consumer may have one. Hydrants, public, 80; private, 4. CONSUMPTION.—(Galls.), av. 700,000. PRESSURE.—Ordinary, 43 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $98,000. Bonded debt, $90,000, at 6%, due yearly; $4,000, at 6%, due semi-nannually. Expenses: Operating, $4,000. Revenue, $4,800. Deficits are met by general taxation. MANAGEMENT.—Mayor, Wm. H. Penman; Clerk, Wm. Hale; Treas., Jas. Galoway; Supt., W. J. Glover, Chn. W. Comrs. Ch. Pump. Engr., I. Wilcoxson. Rept. by Mayor, June 22, '96. SEWERS.—Has partial system of sanitary sewers.

30. **EDINBURG,** Johnson Co. (2,031.) Built in '93 by town. Engr., Jno. J. Hainesworth, Franklin. Contrs., Stevens & Bedward. SUPPLY.—Well, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Laidlaw-Dunn-Gordon comp. dup. Pittsburg nut and slack coal used; av. cost, $1.65 per short ton. STAND-PIPE.—Cap., 95,200 galls.; 18 × 50 ft., on a hill 70 ft. above main street. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general fund. Taps made by Edinburg Foundry & Machine Co. for 25 cts. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 33. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cap. Stock, paid-up, $200. Bonded debt, $15,000, at 6%. Expenses: Operating, $900. MANAGEMENT.—Jno. B. Swain; Secy., E. E. Carvin; Treas., Lee Slater; Supt., G. W. Weare; Ch. Pump. Engr., J. T. Wicker. Rept. by G. W. Weare, June 16, '96. SEWERS.—None.

31. **ELKHART,** Elkhart Co. (11,360.) Built in '84 by Elkhart Water Co. FRANCHISE.—20 yrs.; provides for purchase of works by city in '99 at cost, and 10% additional. Rates are fixed in franchise. SUPPLY.—Surface well, 20 × 35 ft., pumping to tank and direct. Press report since '91 stated new well would be sunk, 5,000,000 pump added and tank replaced by a stand-pipe; no indication whether improvements were carried out. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Smith & Vaile. TANK.—Cap., 106,000 galls.; wood, 30 × 20 ft., on timber trestle 70 ft. high. DISTRIBUTION.—(In '88.) Mains, 12 miles. Taps, 700. Meters, 25. Hydrants, 125. PRESSURE.—(In '89.) Ordinary, 38 lbs.; fire, 100 lbs. FINANCIAL.—(In '88.) Cost, $115,000. Bonded debt, $100,000, at 6%. Expenses, $10,500: Operating, $4,500; int., $6,000. Revenue: $14,475: Consumers, $5,500; City, fire protection, $8,975. NOTE.—No rept. since '90-1 Manual. SEWERS.—Is partially sewered. REFERENCE.—Eng. News, Jan. 24, '85.

32. **ELWOOD,** Madison Co. (2,284.) Built in '91 by Co.; put in operation in June. Cont., E. T. Sutphin. FRANCHISE.—25 yrs. from '91; provides for purchase of works by city at any time. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental only. No legal difficulties. SUPPLY.—Ar-

tesian wells, pumping direct. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane comp. dup. Natural gas used. RESERVOIR.—Cap., 1,000,000 galls.; storage. FISCAL YEAR CLOSED June, '96. DISTRIBUTION.—Mains, 11 miles; cost extensions met by hydrant rental for fire protection. Taps, 700; made by consumer. Services, galv. t.; paid for by consumer. Meters: 30; owned, controlled and repaired by Co.; yearly rental, $3.00. Use of meters optional with consumer. Meters mostly used by steam users. Hydrants, public, 118; private, 15. CONSUMPTION.—(Galls.) av., 500,000; max., 700,000; min., 400,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Expenses: Operating, $2,500. MANAGEMENT.—Supt., W. G. Curtis; Ch. Pump. Engr., H. Ferguson. Rept. by Supt., June 22, '96. SEWERS.—Has sanitary and storm sewers.

33. **EVANSVILLE,** Vanderburg Co. (50,756.) Built in '70-3 by city. Extensive improvements made in '96-7. Engr., Chas. Hermany, Louisville. SUPPLY.—Ohio River, pumping direct. PUMPS.—Cap., 18,000,000 galls.: 2—4,000,000 Holly vert. rotative; 4,000,000 and 6,000,000 Laidlaw-Dunn-Gordon, added in '91 and '93, respectively. New station under construction, with 2—14,000,000 Holly vert. triple exp. Av. cost of coal used, 90 cents per short ton. RESERVOIRS.—Cap., 1,250,000 galls.; storage; 750,000 and 500,000. FISCAL YEAR CLOSED April 1. DISTRIBUTION.—Mains, 60 miles; cost extensions met by revenue. Taps, 5,000; made by city. Services, galv. t.; paid for by consumer. Meters: 6; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 425; private, 20. CONSUMPTION.—(Galls.) max., 7,000,000; min., 6,000,000. . PRESSURE.—Ordinary, 35 to 40 lbs.; fire, 80 to 100 lbs. Steam fire engines are used only "on second alarm." Floating debt, $400,000, at 6%. Sinking Fund, none. Expenses: Operating, $30,000. Revenue: Consumers, unmetered, $68,000; City, none. MANAGEMENT.—Prest., David Kronenberger; Secy., Louis Weinheimer. Rept. by Supt., Jno. W. Peck, June 12, '96. PROJECTED IMPROVEMENTS.—New works are under construction. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 28, '82.

34. **FAIRMOUNT,** Grant Co. (1,462.) Built in '94 by city. SUPPLY.—Wells. No further information could be obtained.

35. **FORT WAYNE,** Allen Co. (35,393.) Built in '79-80 by city. SUPPLY.—Wells, pumping direct and to reservoir. PUMP.—Cap., 11,000,000 galls.; Holly: 6,000,000 vert. triple exp.; 2,000,000 hor. dup.; 3,000,000 quadruplex. Gas used. RESERVOIR.—Cap., 3,500,000 galls.; 97 ft. above center of city. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 72 miles; cost extensions met by rentals and appropriations. Taps, 6,015; made by city for $5. Services, lead; paid for by property owner. Meters: 700; owned by city and consumer; controlled by city; yearly rental, 10 to 20 cents per mo. Use of meters compulsory for hotels and large buildings. City can compel use of meters and any consumer may have one. Hydrants, public, 609; private, 14. CONSUMPTION.—(Galls.) av., 3,000,000; max., 4,500,000; min., 2,500,000. PRESSURE.—Ordinary and fire, 45 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $285,800, at 6%; due '99 and 1900. Expenses: Operating, $12,318. MANAGEMENT.—Prest., Wm. Bittler; Secy. and Treas., P. J. McDonald; Ch. Pump. Engr., Thos. Baxter. Rept. by Secy., June 3, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Oct. 8, '81.

36. **FOWLER,** Benton Co. (1,285.) Built in '95 by city (see foot note, p. 318). Contrs., Seckner Contracting Co., Chicago. Contract price, $34,985.

37. **FRANKFORT,** Clinton Co. (5,919.) Built in '85 by Frankfort Water-Works Co. FRANCHISE.—20 yrs. City to pay for hydrant rental at $60 and $40 each. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Knowles. RESERVOIRS.—Cap., 310,000 galls. Two storage: 185,000 and 125,000. DISTRIBUTION.—Mains, 15 miles. Taps, 955. Hydrants, public, 110. PRESSURE.—Ordinary, 45 lbs.; fire, 65 to 110 lbs. FINANCIAL.—Cap. Stock, $100,000. Bonded debt, $60,000, at 6% after 10 yrs.; 10% of the gross earnings from private consumers to be set aside to redeem bonds. Expenses, $7,100: Operating, $3,500; int., $3,600. Revenue, $15,000: Consumers, $10,000; City, fire protection, $5,000. MANAGEMENT.—Prest., D. A. Coulter. Rept. by Secy. and Supt., J. B. Marvin, Oct. 30, '96.

38. **FRANKLIN,** Johnson Co. (3,781.) Built in '90-1 by Franklin Water, Light & Power Co.; put in operation Sept. 4. City to pay $50 per hydrant per yr. (in '92). SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon. STAND-PIPE.—Cap., 120,000 galls.; steel; 12½ × 40 ft. DISTRIBUTION.—Mains, 8 miles. Taps, 375. Hydrants, public, 66. FINANCIAL.—Cap. Stock, $160,000. Bonded debt, $100,000, at 6%. Revenue: City, fire protection, $3,000. MANAGEMENT.—Prest., L. J. Kendall, Tampico; Vice-Prest. and Supt., F. E. Valentine; Secy., W. B. Jennings; Treas., F. W. Woolen. Rept. by Supt., Sept. 28, '96.

39. **GARRETT,** De Kalb Co. (2,767.) Built by city (see footnote, p. 318); completed July 1, '96. Engr., Martin Marion, Garrett. Contrs., Howe Pump & Engine Co., Indianapolis. SUPPLY.—Four 8-in. wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers as furnished in '95). FINANCIAL.—Cost, $45,000. MANAGEMENT.—Prest., Danl. Widmer; Secy., J. D. Paul. Rept. by Cy. Clk., W. J. Martin, July 6, '96.

40. **GOSHEN,** Elkhart Co. (6,033.) Built in '81 by town. Water and lighting plants operated together. SUPPLY.—Two 27 × 30-ft. open wells, pumping to stand-pipe or direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Deane. (Makers rept. Hughes.) STAND-PIPE.—Cap., 266,000 galls.; 18 × 140 ft. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 20½ miles. Taps, 1,050. Services, galv. i. Meters, 1. Hydrants, public, 141. CONSUMPTION.—(Galls.) av., 2,000,000. FINANCIAL.—Cost, (in '90), $80,000. Bonded debt, $18,000. Expenses: Operating, $7,000. Revenue, $6,800. MANAGEMENT.—Chn., Edward Kelly; City Clk., F. B. Leaming. Rept. by Supt. and Ch. Engr., C. S. Dill, Oct. 30, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Mar. 24, '83.

41. **GREENCASTLE,** Putnam Co. (4,390.) Built in '86 by Greencastle Water-Works Co. FRANCHISE.—20 yrs.; provides for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Walnut Creek and six artesian wells, pumping to stand-pipe. Press rept. in '93 mentioned a filter crib, just completed. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Deane comp. cond. Bituminous coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 398,000 galls.; 22 × 140 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by income. Taps, 350; made by Co., free. Services, iron; paid for by Co. Meters: 16; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 105. CONSUMPTION.—(Galls.) av., 600,000; max., 750,000; min., 400,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $303,000. Cap. Stock: Authorized, $150,000; all paid-up. Bonded debt, $150,000, at 6%. Expenses, $16,800: Operating, $6,000; int., $9,000; taxes, $1,800. MANAGEMENT.—Prest., D. E. Williamson; Secy. and Treas., Walter Wood; Supt., Z. Potter. Rept. by R. D. Wood & Co., Philadelphia, Pa., Aug. 12, '96. SEWERS.—None. REFERENCE.—Stand-pipe accident, Eng. News, Apr. 26, '94.

42. **GREENFIELD,** Hancock Co. (3,100.) Built in '94 by city. Engrs., Voorhees & Witmer, Buffalo, N. Y. Contrs. (press rept.), Snyder & Williams, Dayton, O. SUPPLY.—Wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; two Hughes. DISTRIBUTION.—Mains, 6 miles. Hydrants, 60. FINANCIAL.—Cost, $50,000. Information from unsigned rept., in '96, and official advertisement; subject to revision.

43. **GREENSBURG,** Decatur Co. (3,596.) Now owned by Prudential Water Co., Rochester, N. Y. Built in '89 by Greensburg Water Co. FRANCHISE.—20 yrs. from '90. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Driven wells, pumping direct; a 25 × 25-ft. storage well is drawn from in case of fire. PUMPS.—Cap., 1,500,000 galls.; two Knowles comp. non-cond. Av. cost of coal used, $1.80 per short ton. FISCAL YEAR CLOSED May 13. DISTRIBUTION.—Mains, 7 miles; cost extensions met by Co. Taps, made by Co. for $4.50. Services, galv. i.; paid for by Co. Meters, 20; owned by Co. Use of meters optional with consumer; compulsory for R. R., livery stable and public building. Hydrants, public, 125. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cost, $100,000. Cap. Stock, $100,000. Bonded debt, $100,000. MANAGEMENT.—Treas. and Genl. Mgr., Wm. F. Ross, Rochester, N. Y.; Ch. Pump. Engr., Wm. Kirkpatrick. Rept. by Supt., Robt. Naegel, June 4, '96. SEWERS.—None.

44. **HAMMOND,** Lake Co. (5,428.) Built in '88 by city (see footnote, p. 318). SUPPLY.—Lake Michigan, pumping direct and to stand-pipe. PUMPS.—Cap., 4,500,000 galls.; 3,000,000 comp. cond. and 2—750,000 simple high pressure Worthington. Indiana block bituminous coal used; av. cost, $2.45 per short ton. STAND-PIPE.—Cap., 60,000 galls.; steel; 10 × 100 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains; cost extensions met by water fund. Taps, 850; made by city for $2.50. Services, lead and iron; paid for by consumer. Meters: 12; owned and repaired by consumer; controlled by city. Use of meters optional with city; compulsory for factories and R. R.; large consumers may have them. Hydrants, public, 125; private, 23. CONSUMPTION.—(Galls.) av., 2,250,000; max., 3,000,000; min., 2,000,000. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $200,000. Floating debt, $2,500, at 6%; bonded, $17,000, at 6%; due 1907; $25,000 at 6%; due 1912. No sinking fund. Expenses: Operating, $10,000. Revenue: Consumers, unmetered, $8,000; metered, $10,000; street sprinkling, $25 to $50. Bonds are paid by general tax. MANAGEMENT.—Mayor, F. R. Mott; Clk., Frank Hess., City Treas., Wm. Kleihege, Sr.; Supt. and Cy. C. E., W. F. Bridge; Ch. Pump. Engr., Peter Niurno. Rept. by Supt., Aug. 29, '96. PROJECTED IMPROVEMENTS.—New intake well. SEWERS.—Has sanitary and storm sewers.

45. **HARTFORD CITY,** Blackford Co. (2,287.) Built in '94 by Hartford City Water-Works Co. Aug., '94, Cy. Clk., Roll Manor, rept. contract had been awarded to Boughen Engineering Co., Cincinnati. PUMPS.—Cap., 2,000.000 galls.; Laidlaw-Dunn-Gordon (rept. by makers as furnished in '97). FINANCIAL.—Cap. Stock: Authorized (in '94), $25,000. MANAGEMENT.—Directors (in '94): Frederick B. Leopold, Wm. H. Gable and Chas. W. Cole; all of Hartford.

46. **HAUGHVILLE,** Marion Co. (2,144.) Built in '94 by Indianapolis Water Co.;

put in operation in May. FRANCHISE.—30 yrs. from '94; provides for purchase of works by city in 5 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per hydrant. No legal difficulties. SUPPLY.—From Indianapolis Works. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4½ miles. Taps, 50. Services, lead; paid for by property owner. Meters, 0. Hydrants, public, 43; private, 1. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Revenue; City, fire protection, $2,150. MANAGEMENT.—Indianapolis Water Co. Kept. by F. A. W. Davis, Indianapolis.

47. **HUNTINGBURG,** Dubois Co. (3,167.) Built in '93 by city. SUPPLY.—By pumping. PUMPS.—Cap., 1,500,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers).

48. **HUNTINGTON,** Huntington Co. (7,328.) Owned by city (see footnote p. 318); built in '90-1 by Huntington Water Co. On completion of works Co. assigned its stock to city, which is now sole owner. Alvord & Shields, Chicago, rept. that system was "revised" by them in '94. SUPPLY.—Driven wells for domestic use. Wabash River for fire protection, pumping direct. Nov. 5, '91, W. B. Ewing, Chicago, repts. he was Engr. for 20 × 32-ft. open well, just completed. PUMPS.—Cap., 5,500,000 (?) galls.: 2—1,500,000 Gordon comp. cond.; 2,500,000 Worthington comp. non-cond. mentioned in press repts. as added in '94, and also rept. by makers. DISTRIBUTION.—Mains, 12.4 miles. Taps, 175. Hydrants, 125. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $110,000. Bonded debt, $110,000, at 6%. NOTE.—No official rept. since '90-1 Manual.

49. **INDIANAPOLIS,** Marion Co. (105,436.) Now owned by Indianapolis Water Co. Built in '70 by Co. and sold at sheriff's sale to present Co. in '80-1. Supplies Brightwood, Haughville, Mt. Jackson and West Indianapolis. FRANCHISE.—50 yrs. from '81; provides for purchase of works by city at any six mos. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. SUPPLY.—Wells and filter gallery, pumping direct. PUMPS.—Cap., 59,000,000 galls.; four water power, 10,000,000; one 4,500,000 rotary; 7,500,000 Holly quadruplex; 12,000,000 Holly-Gaskill hor., high-duty; 25,000,000 Snow triple exp. cond. Gas used. FILTERS.—Sand, gravel and charcoal; filter gallery described in '89 Manual as 2,000 ft. long, partly covered. RESERVOIRS.—Cap., 4,000,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 157 miles; cost extensions met by receipts on bonds. Taps, 7,000; made by Co. free. Services, lead; paid for by consumer or property owner. Meters: 500; owned by Co.; yearly rental, none. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 1,217; private, 25. CONSUMPTION.—(Galls.) av., 9,000,000; max., 15,000,000; min., 6,500,000. PRESSURE.—Ordinary, 65 lbs.; fire, 125 lbs. Steam fire engines are seldom used. FINANCIAL.—Cap. Stock: Authorized, $50,000, all paid-up; paid no div'd in '95. Bonded debt, $500,000, at 6%; $500,000, at 5%. Expenses: Int., $55,000; taxes, $13,052. Revenue: City, fire protection, $64,933; street sprinkling, $10,000; gross receipts, $273,753. Operating expenses and revenue from consumers not being kept separately, cannot be given. MANAGEMENT.—Prest., T. A. Morris; Secy., M. A. Morris; V.-Prest., Treas. and Supt., F. A. W. Davis; Ch. Pump. Engr., John Rail. Rept. by Supt., June 12, '96. PROJECTED IMPROVEMENTS.—New pumping station and new 25,000,000-gall. pump. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, June 4, 11, '81; water rates, Feb. 27, '92; wells, Sept. 14, '93.

50. **JASPER,** Dubois Co. (1,281.) Built in '95 by town; put in operation Dec. 1. Engrs., Sanders & Porter, Louisville, Ky. No. Contr. SUPPLY.—Potoka River, pumping to reservoir. PUMP.—Cap., 750,000 galls.; Worthington simple high-pressure. Coal used; av. cost, $1.75 per short ton. RESERVOIR.—Cap., 600,000 galls.; on hill near town. DISTRIBUTION.—Mains, 3 miles; cost extensions met by tax levy. Taps, 80; made by consumer; no fee. Services, iron; paid for by consumer. Meters: 1; owned, controlled and repaired by town; no yearly rental charged. Use of meters compulsory for county court house. Town can compel use of meters and any consumer may have one. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 25,000; max., 35,000; min., 10,000. PRESSURE.—Ordinary, 54 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $10,000, at 6%; due 1900 to 1910. Expenses: Operating, $300; int., $300. MANAGEMENT.—Prest., H. Pfan; Secy., A. J. Berger; Treas., C. Soliga; Supt., Geo. Meheinger. Rept. by Prest., Jan. 5, '97. SEWERS.—None.

51. **JEFFERSONVILLE,** Clark Co. (10,666.) Built in '87-8 by Jeffersonville Water Supply Co. FRANCHISE.—50 yrs. SUPPLY.—Infiltration well near Ohio River, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly vert. rotative. STAND-PIPE.—Cap., 199,000 galls.; 15 × 150 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 12 miles. Taps, 348. Hydrants, 118. FINANCIAL.—Cap. Stock, $200,000. Bonded debt, $171,000 at 6%, due 1918-'21. Expenses, $15,960: Operating, $4,500; int., $10,260; taxes, $1,200. Revenue, $16,880: Consumers, $10,200; City, fire protection, $6,680. NOTE.—No rept. since '90-1 Manual.

52. **KENDALLVILLE,** Noble Co. (2,960.) Built in '87 by city. SUPPLY.—Driven wells and lake, pumping direct. PUMPS.—Cap. 1,500,000 galls.; 500,000 Knowles dup.; 1,000,000 Worthington comp. non-cond. Hocking Valley bituminous coal used; av. cost, $2.26 per short ton. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 6 miles; cost extensions, met by general tax. Taps, 376; made by consumer. Services, galv. i.; paid for by consumer. Hydrants, public, 50; private, 3. PRESSURE.—Or-

dinary, 45 lbs.; fire, 80 to 110 lbs. FINANCIAL.—Cost, $80,000. Bonded debt, $13,000, at 6%, due '97. Deficits are met by general taxation. MANAGEMENT.—Rept. by Supt., W. S. Osborne, June 10, '96. SEWERS.—Has sanitary and storm sewers.

53. **KENTLAND**, Newton Co. (918.) Built in '96 by town; put in operation in April. Engr., A. T. Maltby, Chicago, Ill. Contrs., U. S. Wind Engine Co., Batavia, Ill. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 144,000 galls.; Goulds, driven by electric motor. TANK.—Cap., 40,000 galls.; pine; 20 x 20 ft., on steel trestle, 90 ft. high. DISTRIBUTION.—Mains, 4,000 ft.; extensions met by current funds of town. Taps, 40; made by town to curb for $5.00 for family use. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 10. FINANCIAL.—Cost, $6,325. Bonded debt, $6,225. at 6%, due 10 yrs. Sinking Fund will amount to $1,500 by end of next fiscal year. Expenses: Operating, $400; int., $380. MANAGEMENT.—Prest., Chas. Frankenberger; Secy., W. E. Castle; Treas., J. V. Dodson. Rept. by Prest., July 31, '96. SEWERS.—Has storm water sewers only.

54. **KNIGHTSTOWN**, Henry Co. (1,867.) Built in '94 by city; put in operation Oct. 12. Engrs., Boughen Engineering Co., Cincinnati. SUPPLY.—Five 6-in. wells, pumping to stand-pipe; two 10-in. wells being added. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon comp. Wood used. STAND-PIPE.—Cap., 98,000 galls.; 12 x 115 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by taxation. Taps, 320.; made by city, free. Services, galv. i.; paid for by city to curb. Hydrants, public, 56. CONSUMPTION.—(Galls.) av., 90,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $26,000. MANAGEMENT.—Supt., H. M. Sherburn; Ch. Pump. Engr., J. W. Locke. Rept. by Supt., Sept. 1, '96. SEWERS.—Has storm sewers only.

55. **KOKOMO**, Howard Co. (8,261.) Now controlled by the American Water-Works & Guarantee Co., Pittsburg, Pa.; built in '87-8 by Kokomo Water Co. FRANCHISE.—15 yrs. from '97; provides for purchase of works by city in '97 and 1902, price fixed by arbitration. Max. rates fixed in franchise. SUPPLY.—Drilled wells, pumping direct. PUMPS.—Cap., 8,500,000 galls: 2,500,000 Hall; 2,000,000 Buffalo; 2—2,000,000 Deane. DISTRIBUTION.—Mains, 17 miles. Hydrants, public, 285. PRESSURE.—Ordinary, 50 lbs.; fire, 80-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy., J. F. Cockburn; Treas., J. H. Moore; Supt., C. H. Taylor. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Aug. 20, '96. SEWERS.—Has sewers.

56. **LAFAYETTE**, Tippecanoe Co. (16,243.) Built in '75-6 by city. SUPPLY.—Wells and Wabash River, pumping to reservoir (and to stand-pipe for fire pressure in highest part of city, according to '90-1 Manual). PUMPS.—Cap., 5,000,000 galls.; Two Clapp & Jones cond.; 3,000,000 and 2,000,000. Natural gas used. RESERVOIR.—Cap., 4,200,000 galls. STAND-PIPE.—(In '89.) Cap., 243,000 galls.; 24 x 72 ft.; in center of reservoir. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 35 miles; cost extensions met by revenue. Taps, 2,364; made by city. Services, lead; paid for by city. Meters: 124; owned by city. City can compel use of meters and any consumer may have one at his own expense. Hydrants, public, 266. CONSUMPTION.—(Galls.), av., 1,720,533; max., 3,000,000. PRESSURE.—Ordinary and fire, 80 lbs. One steam fire engine is used. FINANCIAL.—Bonded debt, $300,000, at 4½%. Expenses: Operating, $10,010. Revenue: Consumers, $29,806; City, none. MANAGEMENT.—Prest., Wm. Folckemer; Secy. and Supt., Ed. Cunningham; Ch. Pump. Engr., Thos. McLowen. Rept. by Secy. PROJECTED IMPROVEMENTS.—Bids were to be received Mar. 22, '97, for 6,000,000 vert. comp. cond. high duty pump. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 1, '82.

57. **LA GRANGE**, La Grange Co. (1,784.) Built in '93 by town. Engrs., Voorhees & Witmer, Buffalo, N. Y. Contr., E. T. Sykes, Minneapolis, Minn. SUPPLY.—Six driven wells from 90-110 ft. deep, pumping direct. PUMPS.—Cap., 1,500,000 galls.; two Laidlaw-Dunn-Gordon. DISTRIBUTION.—Cost extensions met by taxation. Services, galv. i.; paid for by consumer. Hydrants, public, 43. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Bonded debt, $18,000, at 6%; due in 20 yrs. Expenses: Operating, $1,100. Revenue, $700. MANAGEMENT.—Prest., J. J. Gillett; Secy., E. M. Hutchinson; Treas., D. M. Stroup. Rept. by Prest., Sept., '96. SEWERS.—None.

58. **LA PORTE**, La Porte Co. (7,126.) Built in '70 by city. SUPPLY.—Clear Lake, pumping direct. Lake is 4 x 7 miles. PUMPS.—Cap., 9,000,000(?); 2,000,000 Holly 6-cylinder previously rept. Makers rept. 5,000,000 Nordberg comp. cond. and 2,500,000 Worthington comp. non-cond. DISTRIBUTION.—Mains, 18 miles. Taps, 700. Meters, 0. Hydrants, 110. PRESSURE.—(In '89.) Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $150,000. Bonded debt, $50,000, at 7%. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 1, '84.

P S. **LAWRENCEBURG**, Dearborn Co. (4,284.) Works under discussion, but nothing definite determined. Rept. by Cy. Engr., Geo. W. Fitch, Feb. 8, '97.

59. **LEAVENWORTH**, Crawford Co. (792.) Built in '96 by Co.; put in operation about Nov. SUPPLY.—Spring, pumping to reservoir. FINANCIAL.—Cost, about $6,000. Information from unsigned rept., Dec., '96.

60. **LEBANON**, Boone Co. (3,682.) City bought works July 9, '94, on additional $20,000 bonds; put in operation Oct. 22. Engr., John W. Hill, Cincinnati, O. Contrs., By-

num, Brenton & Co. SUPPLY.—Six wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon. Natural gas is used; av. cost, $400 per yr. STAND-PIPE.—Cap., 194,000 galls.; steel; 20 × 85 ft. (?), on 30-ft. stone pier. FISCAL YEAR CLOSED Oct. 23d. DISTRIBUTION.—Mains, 11 miles; cost extensions met by general water-works fund. Taps, 496; made by city, free, including service to curb. Services, ¾-in. lead; paid for by city. Meters, 6; owned, controlled and repaired by consumer. Use of meters compulsory for ice-plants, factories; can be compelled by city, and any consumer may have one. Hydrants, 97. PRESSURE.—Ordinary, 55 lbs.; fire, 120 to 200 lbs. FINANCIAL.—Cost, $60,000. Floating debt, $7,000; bonded, $53,000. Expenses, int., $2,000. MANAGEMENT.—Treas., C. T. Bryan; Supt., Will A. Tiell; Ch. Pump. Engr., Thos. Waldron. Rept. by Supt., Sept. 12, '96. SEWERS.—Incomplete system of sanitary and storm sewers.

61. **LIBERTY**, Union Co. (1,314.) Built in or since '94 by city. SUPPLY.—(Well?), by pumping. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 McGowan dup. high pressure (rept. by makers). MANAGEMENT.—Address J. E. Stevens.

62. **LIGONIER**, Noble Co. (2,195.) Built in '88-9 by village. SUPPLY.—Four 6-in. driven wells and one open well, pumping direct and to tank. PUMP.—Cap., 500,000 galls.; Deane. TANK.—Cap., 50,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 7 Miles. Taps, 300. Meters, 3. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 157,500. FINANCIAL.—Cost, $33,000. Bonded debt, $10,500, at 6%. Expenses, $1,880: Operating, $1,200; int., $630. Revenue: Consumers, $1,600. MANAGEMENT.—City. City Clerk, Edwin E. Reed; Engr., J. F. Fisel. Rept. by City Clk., Oct. 22, '96.

63. **LOGANSPORT**, Cass Co. (13,328.) Built in '75-6 by city. SUPPLY.—Eel River, pumping direct. The wells which were sunk in the summer of '90, as rept. in the '90-1 Manual, have been abandoned, not being found practicable. PUMPS.—Cap., 5,000,000 galls.; 2,000,000 and 3,000,000 Gordon erected in '76 and '93, respectively (rept. by makers). Manual for '89-90 gave four Cope & Maxwell, with combined cap. of 3,000,000 galls. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Mains, 25 miles. Taps, 2,100. Services, lead. Meters, 12. Hydrants, public, 161. PRESSURE.—(In '89.) Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost (in '90), $225,000. Extensions of mains (10 miles), made since '90, cost, $54,750. Debt, $31,750, at 4%. (Rept. for '90-1 Manual as $160,000, at 5%, due '96 to 1906.) Expenses, $8,168. Revenue, $27,148: Consumers, $20,208; City, fire protection, $6,440. MANAGEMENT.—Water-Works Committee; Chn., Chas. Ringleben; Clerk, D. A. Middleton; Supt., H. H. Montfort; City Engr., W. B. Ray. Rept. by City Engr., Dec. 26, '96. REFERENCE.—Eng. News, Mar. 4, '82.

64. **MADISON**, Jefferson Co. (8,936.) Built in '49 by city. Local press rept., Apr., '95, stated city had made 15-yr. contract with Madison Machine Co., at $6,200 per yr.: latter to replace old pumps with Worthington, put in new boilers, operate pumping plant, keep it and reservoirs in repair, and deliver 1,000,000 galls. of water per day, if needed. At end of contract improvements to plant to become property of city. SUPPLY.—Infiltration well, near Ohio River, pumping to reservoirs. PUMPS.—Two 1,000,000 Worthington vert. comp. cond. rept. by makers. RESERVOIRS.—Two small; 212 ft. above river. DISTRIBUTION.—(In '87.) Mains, 12 miles. Taps, 700. Services, w. i. Meters, 0. Hydrants, 240. FINANCIAL.—(In '86.) Cost, $135,000. NOTE.—No official rept. since '90-1 Manual. REFERENCE. Eng. News, June 17, '82.

65. **MARION**, Grant Co. (8,769.) Built in '77 by city. SUPPLY.—Wells, pumping direct. PUMPS.—Cap., 650,000 galls.; 250,000 Deane and 400,000 Fairbanks-Morse. Natural gas used: city owns wells. RESERVOIR.—Cap., 196,000 galls. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 16 miles; cost extensions met by extension fund. Taps, 600; made by consumer for 50 cts. Services, lead and galv. i.; paid for by property owners. Meters: 4; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for greenhouses and electric light plant. City can compl the use of meters and any consumer may have one. Hydrants, public, 126. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $2,000, at 8%; due '97; $2,000, at 6%; due '97; $10,000, at 6%; due '97 to 1901; $8,500, at 5%; due 1901 to '16. Sinking Fund: $3,000, not invested. Expenses: Operating, $4,000. Revenue: Consumers, $7,500; public buildings, churches and schools, free. MANAGEMENT.—Prest., Wm. E. Hogin; Secy., Henry F. Clunk; Treas., Mort. McRae; Supt., Chas. W. Hamilton; Ch. Pump. Engr., Geo. M. Young. Rept. by Secy., June 8, '96. PROJECTED IMPROVEMENTS.—New 750,000-gall. reservoir. SEWERS.—None. REFERENCE.—Eng. News, Dec. 16, '82.

66. **MARTINSVILLE**, Morgan Co. (2,680.) Built in '94 by city; put in operation June, '94. Engrs., Philip & C. H. Goss. Contrs., Carothers & Crane. SUPPLY.—Driven wells, and open well 30 × 30 ft, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon comp. Mine run bituminous coal used; av. cost, $1.40 per short ton. DISTRIBUTION.—Mains, 7 miles; cost extensions met by taxation, and by water rents. Taps, 305; made by city for $2.65. Services, ¾-in. galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 53; private, 1. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $25,000. Bonded debt,

$18,000, at 5%. Expenses, $2,627: Operating, about $1,700; int., $900; taxes, $27. Revenue: Consumers, $2,000; City, none. Deficits met by taxation. MANAGEMENT.—Supt., Benj. Kriner; Ch. Pump. Engrs., Helton & Farr. Rept. by D. P. Kennedy, Sept. 17, '96. SEWERS.—None.

67. **MICHIGAN CITY,** La Porte Co. (10,776.) First supplied in '75 by city; present system built in '88 by city. SUPPLY.—Springs and Trail Creek, pumping to tank and direct. PUMPS.—Cap., 3,500,000 galls.; 2,000,000 Holly hor. dup., and 1,500,000 Worthington. Indiana lump bituminous coal used; av. cost, $1.85 per short ton. TANK.—Cap., 120,000 galls. DISTRIBUTION.—Mains, not given; cost extensions met by general fund. Taps, 835; made by city for $3.50. Services, lead; paid for by consumer; expect to introduce meters shortly. Hydrants, public, 135; private, 41. CONSUMPTION.—(Galls.) av., 4,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 95 lbs. Steam fire engines are used, but not often. FINANCIAL.—(In '90.) Cost, $85,000. Bonded debt, $15,000. Expenses: Operating, $5,000; int., $900. Revenue, $5,000. MANAGEMENT.—Supt., A. W. Frehse; Ch. Pump. Engr., Henry Wendt. Rept. by Supt., Nov. 18, '96. PROJECTED IMPROVEMENTS.—Larger pump. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 21, '84.

68. **MIDDLETOWN,** Henry Co. (851.) Built in '96 by town; put in operation June 1. Engr., T. C. Hefel, Muncie. No Contr. SUPPLY.—Flowing wells, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 McGowan comp. dup. Natural gas used; av. cost, $150 per yr. RESERVOIR.—Cap., 250,000 galls.; storage. DISTRIBUTION.—Mains, 3½ miles. Taps, 75; made by town for $7. Services, galv. i.; paid for by consumer. Hydrants, public, 29. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $10,000, at 6%, due 1900 to 1914. MANAGEMENT.—Prest., J. O. Lambert; Secy., J. W. Farrell; Treas., H. B. Cassell; Supt., J. O. Lambert; Ch. Pump. Engr., B. F. Jackson. Rept. by Supt., Dec. 12, '96. SEWERS.—None.

69. **MISHAWAKA,** Saint Joseph Co. (3,371.) Owned by city; built in '90-1 by Mishawaka Water-Works Co., which turned plant over to city as soon as finished. In '73 works for fire protection, street and lawn sprinkling were built by Perkins Windmill & Axe Co. SUPPLY.—St. Joseph River, pumping direct. PUMPS.—Cap., 5,000,000 galls.; 2—1,000,000 Walker, and 2—1,500,000 Gordon. W. Va. run of mine bituminous coal used; av. cost, $2.30 per short ton. DISTRIBUTION.—Mains, 11 miles; cost extensions met by regular tax. Taps, 420; made by city. Services, galv. i.; paid for by property owner. City can compel use of meters and any consumer may have one. Hydrants, public, 73; private, 13. CONSUMPTION.—(Galls.) av., 350,000; max., 1,000,000; min., 250,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $56,000. Bonded debt, $30,000, at 6%. Expenses: Operating, $2,200. Revenue: City, fire protection, none; street sprinkling, $24. MANAGEMENT.—Prest., J. C. Protsman. Rept. by Supt., T. A. Bien, July 9, '96. SEWERS.—None. REFERENCE.—Eng. News, June 10, '82.

70. **MONTICELLO,** White Co. (1,518.) Built in '95. Owned by city (subject to mortgage held by Monticello Water-Works Co.†, see foot note, p. 318). Engrs., Alvord & Shields, The Rookery, Chicago. Contrs., Mansfield & Allen, Indianapolis. SUPPLY.—Well and river, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. non-cond. (rept. by makers). MANAGEMENT.—Address, W. Winn. Rept. from W. P. Bushnell, July 27,'95, and Clk., B. Van Voorst, Sept. 25, '95.

71. **MONTPELIER,** Blackford Co. (808.) Build in '96 by Montpelier Light & Water Co.; put in operation May 26. Contrs., Derheimer & Shanklin. FRANCHISE.—Perpetual from '96; provides for purchase of works by city in 15 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Flowing wells, pumping direct from collecting basin. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon & Maxwell dup., a comp. and a high-pressure. Natural gas used; free. RESERVOIR.—Cap., 400,000 galls.; collecting basin, 50 × 50 × 30 ft. DISTRIBUTION.—Taps, 40; made by Co. for $8, including service. Services, lead; paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 40. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 40 lbs.; fire, 20 lbs. FINANCIAL.—Cost, about $41,000. Cap. Stock: Authorized, $60,000; all paid-up. Bonded debt, $60,000, at 6%; due in 25 yrs. Cannot separate figures as the water-works are run in connection with the electric light plant. MANAGEMENT.—Prest., Jos. Derheimer, Fort Wayne; Vice-Prest., Geo. G. Darrow; Secy., W. C. Shanklin; Treas., J. H. Shoemaker; Supt., W. S. Zehrung; Ch. Pump. Engr., T. I. Teitz. Rept. by Supt., Dec. 15, '96. SEWERS.—No sanitary sewers, except private ones; storm sewers are contracted for.

72. **MOUNT JACKSON,** Marion Co. (313.) Built in '96 by Indianapolis Water Co. FRANCHISE.—30 yrs. from '96; provides for purchase of works by city in 5 yrs. Rates are fixed in franchise and are subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per hydrant. No legal difficulties. SUPPLY.—Indianapolis works. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 1¼ miles. Services, lead. Meters, 0. Use of meters compulsory for manufacturers. Hydrants, public, 11. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Indianapolis Water Co. Rept. by Supt., F. A. W. Davis.

73. **MOUNT VERNON,** Posey Co. (4,705.) Built in '60 by Mount Vernon Water Co.; controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. SUPPLY.—Ohio River, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Blake. STAND-PIPE.—Cap., 158,000 galls.; 15 × 120 ft. DISTRIBUTION.—Mains, 9 miles. Hydrants, public, 77. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., W. S. Kuhn, Pittsburg, Pa. Secy. and Treas., J. F. Cockburn; Supt., Benj. Hunter. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96. SEWERS.—Has sewers.

74. **MUNCIE,** Delaware Co. (11,345.) Built in '85 by Muncie Water-Works Co.; now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—25 yrs.; provides for purchase of works by city in 1905, price to be determined by arbitration. Max. rates are fixed in franchise. SUPPLY.—Artesian wells, pumping direct from filter galleries. PUMPS.—Cap., 9,000,000 galls.; 3—2,500,000 and 1—1,500,000 Worthington. DISTRIBUTION.—Mains, 24 miles. Hydrants, 161. PRESSURE.—Ordinary, 50 lbs.; fire, 80-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., W. S. Kuhn, Pittsburg, Pa.; Secy. and Treas., J. H. Purdy; Supt., Q. Walling. Rept. by Am. W.-W. & Guarantee Co., Pittsburg, Pa., Aug. 20, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Apr. 17, '86.

75. **NAPPANEE,** Elkhart Co. (1,493.) Built in '93 by city. Engrs., Fairbanks, Morse & Co., Chicago, Ill. Contr., James Madden, Ft. Wayne. SUPPLY.—3 wells, 140 ft. deep, pumping to tank. PUMPS.—Cook deep well. TANK.—Cap., 63,000 galls.; yellow pine; 24 × 20 ft., on pine tower 70 ft. high. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by general tax. Taps, 305; made by city for $2. Services, ¾-in. galv. i.; paid for by consumer. Meters: 4; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for saloons and laundries. City can compel use of meters and any consumer may have one. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 33,000. PRESSURE.—Ordinary, 40 lbs.; fire, 70 lbs. MANAGEMENT.—Kept. by Town Clk., Perry A. Harly, Aug. 1, '96. SEWERS.—Has storm sewers only. REFERENCES.—Stand-pipe failure. Eng. News, Sept. 1, 15, '92, Jan. 28, '93, May 3, '94.

76. **NEW ALBANY,** Floyd Co. (21,059.) Built in '75 by New Albany Water-Works Co. FRANCHISE.—20 yrs. from '95. Co. is not exempt from local taxes. City to pay $16,000 per annum for public service. No legal difficulties. SUPPLY.—Ohio River, pumping to reservoirs. PUMPS.—Cap., 4,000,000 galls.; two Hegewald & Co., walking beam, double plunger, 2,500,000 and 1,500,000 galls. Pittsburg nut and slack used; av. cost, $1.25 per short ton. RESERVOIRS.—Cap., 24,000,000 galls.; storage; 6,000,000; 2—1,500,000 and 15,000,000. Three smaller reservoirs previously reported as settling basins, side by side, 192 ft. above city. Water was pumped to largest and passed from this to second, thence to third, discharging into vertical pipe outside and 6-ft. below bottom of reservoir for aeration. FISCAL YEAR CLOSED Dec 31, '95. DISTRIBUTION.—Mains, 26 miles; cost extensions met by Co. Taps, 1,400; made by Co. Services, lead and galv. i.; paid for by Co. to property line. Meters: 48; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for factories, etc. Hydrants, public, 175; private, 10. CONSUMPTION.—(Galls.) max., 1,500,000; min., 600,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $400,000. MANAGEMENT.—Prest., W. H. Dillingham; Secy. and Treas., R. K. Brown; Supt., W. W. Brooks; Ch. Pump. Engr., C. H. Fitch. Rept. by Co., June 4, '96. SEWERS.—None. REFERENCE.—Eng. News, Aug. 13, '81.

77. **NEW CARLISLE,** St. Joseph Co. (607.) Built in '79 by town. SUPPLY.—Well, pumping to tank, and direct for fire protection. Well (in '89), 10 × 35 ft., with four 2½-in. driven wells in bottom. PUMPS.—Cap., 335,000 galls.; Worthington. TANK.—Cap., 35,000 galls.; wood; 18 × 22 × 25 ft., on timber trestle. DISTRIBUTION.—(In '87.) Mains, 2 miles. Taps, 100. Meters, 0. Hydrants, 17. PRESSURE.—(In '89.) Ordinary, 36 lbs.; fire, 80 to 100 lbs. FINANCIAL.—(In '87.) Cost, $10,400. Bonded debt, $4,500, at 7%. Expenses, $890: Operating, $575; int., $315. Revenue: Consumers, $400. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, July 29, '82.

78. **NEW CASTLE,** Henry Co. (2,697.) Built in '89 by city. SUPPLY.—Five artesian wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Holly hor. dup. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 9 miles. Taps, 225. Hydrants, public, 52. FINANCIAL.—Cost, $27,000. Debt, $15,000. MANAGEMENT.—Supt., H. L. Shopp.

P 4. **NEW HARMONY,** Posey Co. (1,197.) Co. works under discussion. Rept. by Wm. Richards, Jan., '97.

79. **NEW HAVEN,** Allen Co. (1,079.) Built in '93 by town; put in operation in Sept. Engrs., Criddenton & Clark, Toledo, O. Contrs., Ryan & Surrell, Fort Wayne. SUPPLY.—Flowing well, pumping direct from collecting and storage reservoir, near pumping station. PUMP.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon dup. Hocking Valley bituminous coal used; av. cost, $2.55 per short ton. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 1.8 miles; cost extensions met by taxation. Taps, 47; made by consumer, no fee. Services, lead; paid for by by town. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 12; private,

8. CONSUMPTION.—(Galls.) max., 180,000; min., 120,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $6,300. Bonded debt, $4,800, at 6%; due in 1900 and yearly thereafter in amounts of $1,000 each. No sinking fund. Expenses: Operating, about, $850; int., $288. Revenue: Consumers, about, $300. All deficits are met by taxation. Int. will be met by taxation; surplus will be used for extensions. MANAGEMENT.—Prest., L. S. Null; Secy., B. H. Schneiker; Treas., A. R. Schnitker; Supt., Robt. Smith; Ch. Pump. Engr., J. H. McCarthy. Rept. by D. H. F. Berberich, Jan. 6, '97. SEWERS.—None.

80. **NOBLESVILLE,** Hamilton Co. (3,054.) Built in '91 by Co. Engr., A. D. Cook, Toledo, O. Contrs., Snyder & Williams, Dayton, O. FRANCHISE.—25 yrs. from '91; provides for purchase of works by city each 5 yrs. Rates are fixed in franchise; maximum schedule agreed upon. Co. is not exempt from local taxes. City to pay $33½ per hydrant annually; 25-yrs. contract ending 1916. No legal difficulties. SUPPLY.—Wells, pumping direct. PUMPS.—Cap., 3,000,000 galls. 2—1,500,000 Deane comp. dup. Natural gas used; av. cost, $300 per year. FISCAL YEAR CLOSED June 4. DISTRIBUTION.—Mains, 9 miles; cost extensions met by assessment of stock and by revenue. Services lead; paid for by Co. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 91. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $60,000. Cap. Stock: Authorized, $50,000; paid-up, $47,500; paid no div'd in '95. Bonded debt, $40,000, at 6%; due 1907. Sinking Fund, none. Expenses: Operating, $2,500; int., $2,400. Revenue: Consumers, $5,000; City, fire protection, $3,033. MANAGEMENT.—Prest., Julius Joseph; Secy., J. W. Smith; Treas., Geo. S. Christian; Ch. Pump. Engr., W. A. Semans. Rept. by Secy., July 31, '96. SEWERS.—Has sanitary and storm sewers only.

81. **NORTH MANCHESTER,** Wabash Co. (2,384.) Built in '94 by city. Engrs. and Contrs., C. E. Coon & Co., Upper Sandusky, O. No legal difficulties. SUPPLY.—6-in. driven wells and stream, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 McGowan dup. high pressure. Parke county (Ind.) bituminous nut coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 165,440 galls.; steel; 16 × 110 ft. DISTRIBUTION.—Mains, 5 miles; cost extensions met by general fund. Taps, 290; made by consumer for $9, ¾-in.; $10, 1-in. Services, galv. i.; paid for by consumer. Meters: 6; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for hotels, restaurants, liveries. City can compel the use of meters and any consumer may have one. Hydrants, public, 60; private, 12. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 62 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $35,000. Bonded debt, $32,000, at 6%. Expenses: Operating, $1,000. MANAGEMENT.—Prest., D. D. Swank; Clk., Jos. Cowgil, Treas., R. A. Schoolcraft; Ch. Pump. Engr., J. Colclesser. Rept. by Prest., June 16, '96.

82. **NORTH VERNON,** Jennings Co. (2,012.) Built in '92-3 by city. Engrs. and Contrs., Boughen Engineering Co., Cincinnati, O. SUPPLY.—Muscatatuck River, pumping from filter gallery in impounding reservoir to stand-pipe. PUMP.—Cap., 1,500,000 galls.; Gordon. Bituminous slack used; av. cost, $1.50 per short ton. FILTER GALLERY.—Cistern cut in solid rock in bottom of stream, hermetically sealed, with trench cut in rock and filled with crushed stone and fine gravel. RESERVOIR.—Cap., 70,000,000 galls.; impounding. STAND-PIPE.—Cap., 86,000 galls.; 12 × 100 ft. on stone foundation on hill 100 ft. above power-house. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by general fund. Taps, 175; made by licensed contractor who receives the fees, $7 for ¼-in., $8 for ½-in. and $8.50 for ¾-in. Services, galv. i.; paid for by property owner. Meters, 0. Supply is so abundant that meters are not required. Hydrants, public, 42; private, 15. CONSUMPTION.—(Galls.) av., 100,000; max., 150,000; min., 50,000. PRESSURE.—Ordinary, 70 lbs.; fire, 90 lbs. One steam fire engine is used. FINANCIAL.—Cost, $28,000. Bonded debt, $13,000, at 6%: Due, $5,000 in '97, $5,000 in 1902, $3,000 in 1907. Sinking Fund: $600, cannot be invested. Expenses: Operating, $1,000; int., $780. Revenue, $2,000. No deficits as yet; should any occur, would be met by general fund. MANAGEMENT.—Mayor, F. W. Verbarg; Clerk, C. H. Everet; Treas., D. B. Ruder; Supt. and Chn. of W.-Wks. Com., G. L. Tripp; Ch. Pump. Engr., Peter Crane. Rept. by W. S. Prather, Mem. of Com., Dec. 14, '96. SEWERS.—None.

83. **PAOLI,** Orange Co. (707.) Built in '93 by town. SUPPLY.—Stream, pumping to reservoir. PUMP.—Cap., 720,000 galls.; Dean. RESERVOIR.—Cap., 200,000 galls.; 50 × 80 × 6 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 75; made by city for $2. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 50,000; max., 75,000; min., 25,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $5,500. Expenses: Operating, $800. MANAGEMENT.—Rept. by Amos Stout, July 31, '96. SEWERS.—None.

84. **PERU,** Miami Co. (7,028.) Built in '79 by city. SUPPLY.—Wabash River from crib and from wells, pumping to reservoir. PUMPS.—Cap., 3,500,000 galls.; 2,000,000 comp. cond. and 1,500,000 non-comp. non-cond. Natural gas used. RESERVOIR.—Cap., 1,250,000 galls.; storage; 93 ft. above pumps, and about 116 ft. above river. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 18 miles; cost extensions met by revenue. Taps, 862, made by city for $5. Services, lead; paid for by city to curb. Meters, 2; owned, controlled and repaired by city. Use of meters compulsory for ice plant and

woolen mills. City can compel the use of meters and any consumer may have one. Hydrants, public, 134; private, 6. CONSUMPTION.—(Galls.) av., 800,000; max., 1,014,789; min., 500,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $170,000. Bonded debt, $75,000, at 8%. Sinking Fund, $5,000. Expenses: Operating, $4,622; int., $3,000. Revenue: Consumers, $13,200. MANAGEMENT.—Common Council. Chn. W.-W. Com., J. D.Oates; Treas., Andrew Wey; Supt., Giles W. Smith; Ch. Pump Engr., B. F. Hann. Rept. by Supt., June 26, '96. SEWERS.—Has storm sewers. REFERENCE.—Eng. News, Dec. 2, '82.

85. **PLYMOUTH,** Marshall Co. (2,723.) Built in '88 by city. SUPPLY.—15 driven wells, flowing to cistern, thence pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Holly hor. dup. DISTRIBUTION.—Mains, 5 miles. Taps, 150. Meters, 3. Hydrants, public, 39. CONSUMPTION.—(Galls.) av., 33,000. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $17,800. Bonded debt, $10,000. Expenses, $2,200; int., $500. Revenue, $1,810. MANAGEMENT.—City Council. Rept. by Mayor, Jos. Swindell, Oct. 3, '96.

86. **PORTLAND,** Jay Co. (3,725.) Built in '95 by city (see footnote, p. 318.); put in operation Apr. 1. Engr., Geo. W. Sturtevant, Chicago, Ill.; Contr., F. Bimel. SUPPLY.—Seven driven wells, pumping direct. PUMPS.—Cap., 1,000,000 galls.; Blake comp. Natural gas used. DISTRIBUTION.—Mains, 10 miles. Taps, 255; made by city for $5. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 102; private, 3. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $55,000. Deficits are met by general taxation. MANAGEMENT.—Treas., E. K. Stanton; Rept. by Supt. and Ch. Pump. Engr., A. H. Abel, June 18, '96. SEWERS.—None.

87. **PRINCETON,** Gibson Co. (3,076.) Built in '93 by Princeton Water & Lighting Co.; put in operation Sept. 1. Engr., Geo. W. Sturtevant, Chicago, Ill.; Contr., C. A. Weeks. FRANCHISE.—25 yrs. from '93; provides for purchase of works by city after 10 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for fire protection. No legal difficulties. SUPPLY.—Patoka River, pumping to stand-pipe. PUMPS.—Cap., 2,780,000 galls.; 1,500,000 Dunn-Gordon, and 1,230,000 Deane dup. Bituminous coal used; av. cost, $1.50 per short ton. STANDPIPE.—Cap., 175,000 galls.; 20 × 75 ft.; iron; on brick foundation on hill. FISCAL YEAR CLOSED Jan. 1, '95. DISTRIBUTION.—Mains, 13 miles; cost extensions met by earnings. Taps, 350; made by consumer. Services, galv. i.; paid for by consumer. Meters: 6; owned and repaired by consumer; controlled by Co.; yearly rental, none. Use of meters compulsory for mills and livery stables. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 101; private, 1. CONSUMPTION.—(Galls.) av., 100,000; max., 150,000; min., 60,000. PRESSURE.—Ordinary, 60 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $72,500. Cap. Stock: Authorized, $50,000; paid-up, 75%; paid 6% div'd in '95. Bonded debt, $20,000, at 6%. Expenses, $3,560: Operating, $1,800; int., $1,200; taxes, $560. Revenue, $8,775: Consumers, unmetered, $4,420; metered, $340; City, fire protection, $4,000; other purposes, $15. MANAGEMENT.—Prest., Thos. R. Paxton; Secy., Treas. and Supt., J. W. Ewing; Ch. Pump. Engr., Chas Seebern. Rept. by Supt. PROJECTED IMPROVEMENTS.—Filter to be put in. SEWERS.—None.

—? **REMINGTON,** Jasper Co. (940.) Press rept., Feb. 1, '97, stated town had just awarded contract for works to Challenge Windmill & Feed Mill Co., Batavia, Ill. Est. cost., $11,000.

88. **RICHMOND,** Wayne Co. (16,608.) Built in '86 by Richmond City Water-Works Co FRANCHISE.—(Including amendments in '92.) 20 yrs. from '92. Provides for purchase of works by city at any time, price to be determined by arbitration. Fixes max. rates. City to pay $55 per yr. each for 225 hydrants on mains in place in '92; additional hydrants on these mains, free forever, but city to pay actual cost of furnishing and setting them. City may order extensions petitioned for by property owners, provided revenue of $49 per 500 ft. of mains is guaranteed by prospective consumers, or city agrees to rent one hydrant at $49 per yr. Co. supply, free, water for practically all public purposes, except fire protection, including street sprinkling from public carts, sewer flushing, city buildings and specified number of fountains and drinking places. Co. also supply water, free, to manufacturers for fire protection, only. No legal difficulties. SUPPLY—Springs, pumping to reservoir from filtration galleries. PUMPS.—Cap., 10,000,000 galls.; 4,000,000 and 10,000,000 Holly-Gaskill hor. high-duty. West Va. bituminous coal used: av. cost, $2.40 per short ton. RESERVOIR.—Cap., 11,000,000; storage. FISCAL YEAR CLOSED July 15. DISTRIBUTION.—Mains, 40 miles. Taps, 2,500; made by Co. for $11, including service to curb. Services, lead and galv. i.; paid for by consumer. Meters: 160; owner by Co. and consumer; controlled and repaired by Co. Use of meters optional with consumer; compulsory for hotel, livery and saloons. Hydrants, public, 240. CONSUMPTION.—(Galls. av., 2,500,000; max., 3,500,000; min., 1,750,000. PRESSURE.—Ordinary, 60 lbs.; fire, 110 lbs. FINANCIAL.—(In '90.) Cap. Stock, $250,000. Debt, $250,000: Floating, $50,000 at 6%; Bonded, $200,000 at 6%. Expenses, $25,500: Operating, $9,000; int., $15,000; taxes, $1,500. Revenue, $27,000: Consumers, $15,000; City, fire protection, $12,000. MANAGEMENT.—Prest., D. K. Zeller; Secy., J. B. Craighead; Treas., M. H. Dill. Rept. by Supt., F. M. Curtis, June 9, '96. SEWERS.—Has sanitary and storm sewers.

89. **ROCHESTER,** Fulton Co. (2,467.) Built in '93 by city. Engrs., Voorhees & Witmer, Buffalo, N. Y. SUPPLY.—By pumping. STAND-PIPE.—Cap., 70,000 galls.; steel, 12 × 125 ft. DISTRIBUTION.—Mains, 7 miles. Hydrants, 80. FINANCIAL.—Cost, probably about $40,000. MANAGEMENT.—Trustees. Rept. from Engrs. in '93; subject to revision.

90. **ROCKPORT,** Spencer Co. (2,314.) Built in '86 by Rockport Water-Works Co.; S. H. Kennedy, owner. FRANCHISE.—50 yrs. from '88; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is exempt from local taxes for 10 yrs. City to pay $40 and $30 per hydrant per yr. No legal difficulties. SUPPLY.—Ohio River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,250,000 galls.; Smith-Vaile, 1,000,000 galls. and 1,250,000. Bituminous slack used; av. cost, $0.75 per short ton. TANK.—Cap., 56,400 galls.; 20 × 24 ft., on oak trestle 36 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by bonds. Taps, 300; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with Co. Meters are to be adopted as soon as filtering system is completed. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 100,000; max., 150,000; min., 50,000. PRESSURE.—Ordinary, 40 to 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock: Authorized, $25,000; all paid-up. Bonded debt, $25,000, at 6%, due 1900. Expenses: Int., $1,380; taxes, $150. Revenue, City, fire protection, $1,000. MANAGEMENT.—Prest., S. W. Stocking. Rept. by Secy. and Supt., S. H. Kennedy, June 6, '96. PROJECTED IMPROVEMENTS.—Extension of suction pipes into sand bar in Ohio River (filter gallery?). SEWERS.—None.

P 5. **ROYAL CENTER,** Cass Co. (527.) Town proposes to build works. Engr., Harry Coleman, Logansport. Contrs. (probably), Stevens & Bedwards, Logansport. Supply, drilled well, pumping to tank. Est. cost, $5,000; bonds to be issued. Unsigned rept., Dec., '96. Press repts. state contract was let to above firm in Aug., '96, but that bonds could not be sold. Jan., '97, press rept. stated contract had been let, but gave no names.

91. **RUSHVILLE,** Rush Co. (3,475.) Built in '96 by Rushville Water Co., in which city owns 310 of 350 shares of stock (see footnote, p. 318). Engrs., Sanders & Porter, Louisville. Contrs., Howe Pump & Engine Co., Indianapolis. FRANCHISE.—20 yrs. from '96. City issued $26,000 of bonds (up to its limit) and turned these, with a $5,000 electric light plant, over to Co. Other $4,000 of stock was owned by Contrs. Co. issued $50,000 of bonds. City to pay $7,000 per yr. hydrant rental and to come into possession of water and electric light plants at expiration of franchise, on buying balance of stock and paying for actual cost of extensions to original plant. Press repts. Jan. and Feb., '97, stated a number of liens had been filed against Co. for material and labor. It is rept. that Co. is controlled by receiver for above-named contractors. SUPPLY.—Driven wells, pumping direct, with reservoir in reserve. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 comp. cond. (rept. by makers). FINANCIAL.—Cost, $85,000. Cap. Stock, paid-up, $35,000. Bonded debt, $50,000 (see above). MANAGEMENT.—Address Co. Information mostly from press repts.

92. **SALEM,** Washington Co. (1,975.) Built in '86 by town. SUPPLY.—Springs, 2 miles from town, pumping to reservoir, with direct pumping for fire protection. PUMPS.—Cap., 500,000 galls.; Deane. RESERVOIRS.—(In '89.) 80 × 120 ft., × 10 ft. deep. DISTRIBUTION.—Mains, 4½ miles. Taps, 231. Services, w. i. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 60,000. FINANCIAL.—Cost, $16,000. Bonded debt, $15,000, at 5%. Expenses, $1,450: Operating, $700; int., $750. MANAGEMENT.—Bd. of Trustees. Supt., W. P. Langwell; Rept. by Town Clk., John W. Spaulding, Sept. 24, '96.

93. **SEYMOUR,** Jackson Co. (5,337.) Built in '89 by Seymour Water Co.; owned by W. E. McMillan. FRANCHISE.—30 yrs. from '90; provides for purchase of works by city at end of 10 yrs. Rates are fixed by city ordinance. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—White River, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; two Smith-Vaile comp. dup. Indiana bituminous coal used; av. cost, $1.65 per short ton. FILTER.—Gravel. (Filter crib 6 ft. wide previously rept.) STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft., steel. FISCAL YEAR CLOSED June 9. DISTRIBUTION.—Mains, 14 miles; cost extensions met by earnings. Taps, 376; made by consumer. Services, galv. i.; paid for by property owner. Meters: 13; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 112; private, 20. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 55 lbs.; fire, 90 lbs. FINANCIAL.—(In '90.) Cap. Stock, $80,000. Bonded debt, $80,000, at 6%. Expenses, $7,425; Operating, $1,775; int., $4,800; taxes, $850. Revenue, $6,261; Consumers, $1,726; City, 4,535. MANAGEMENT.—Prest., W. H. McMillan; Secy., Wm. F. Peter; Treas., B. F. Price. Rept. by Supt., D. W. Johnson, July 9, '96. SEWERS.—Has storm sewers only.

94. **SHELBYVILLE,** Shelby Co. (5,451.).

INDIANA WATER & LIGHT CO.

Organized in '90 to operate water and lighting plants at Shelbyville and Warsaw. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Given separately below and under Warsaw. FINANCIAL.—Cost, $225,000. Cap. Stock, paid up, $300,000. Bonded debt,

$180,000, at 6%. Expenses: Operating and taxes, $5,800; int., $10,800; total, $16,100. Revenue: Consumers, $8,362; Ry., $1,400; City, $12,862; total, $22,624. MANAGEMENT.—W. G. Pine Coffin, New York, N. Y.

LOCAL PLANT.

Built in '86 by Shelbyville Water-Works Co.; now operated by Indiana Water & Light Co., which see above. Press rept. states water and light plants were bid in for bondholders at auction sale on Oct. 21, '95, on account of default of interest on bonds, works having gone into hands of receiver previously. SUPPLY.—Well, pumping to stand-pipe. Well, 35 × 33 ft.; near Blue River. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. STAND-PIPE.—Cap., 18,000 galls.; 5 × 125 ft. DISTRIBUTION.—Mains, 9½ miles. Taps, 585. Services, galv. 1. Meters, 11. Hydrants, public, 109. CONSUMPTION.—(Galls.) av., 400,000. Rept. by Local Mgr., F. M. Nuckolls, Oct. 30, '96.

95. **SOUTH BEND,** Saint Joseph Co. (21,819.) Built in '73 by city. SUPPLY.—62 artesian wells, pumping direct and to reservoir and stand-pipe. PUMPS.—Cap., 13,000,000 galls.; all Deane: 7,000,000 comp. dup.; 3,000,000; also 3—1,000,000 water power. Brazil (Ind.) block coal used; av. cost, $2.01 per short ton delivered. RESERVOIR.—(In '89.) Cap., 500,000 galls.; receiving. STAND-PIPE.—Cap., 80,000 galls.; 6 × 225 ft., iron; in brick masonry tower. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 37 miles; cost extensions met by city taxes. Taps, 3,177; made by city. Services, lead; paid for by property owner. Meters: 130 (in '90); owned, controlled and repaired by city; yearly rental, none. Hydrants, public, 345; private, 83. CONSUMPTION.—(Galls.) av., 1,900,000. PRESSURE.—Ordinary, 80 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $150,000. Bonded debt, $216,000: $125,000 at 5%, due $50,000 in 1893, $7,000 in 1904, $50,000 in 1908, $10,000 in 1913 and $8,000 in 1914; $83,000 at 4%, $58,000 due in 1915 and $25,000 due in 1916. Expenses, $29,944: Operating, $20,124; int., $9,820. Revenue, Consumers, $28,406. "Apportionment of city taxes," $12,263. MANAGEMENT.—Rept. by Supt., John A. Graham, Sept. 24, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 29, '81.

96. **SOUTH WHITLEY,** Whitley Co. (720.) Built in '95 by town; put in operation July. Engr., W. P. Brackenridge. Contr., H. Marigold. SUPPLY.—Four 6-in. driven wells, 65 ft. deep, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Worthington, a comp. non-cond. and a single high pressure. Brazil (Ind.) bituminous coal used; av. cost, $2.50 per short ton. DISTRIBUTION.—Mains, 3¾ miles. Taps, 47; made for $17.25. Services, lead; paid for by owner. Town cannot compel use of meters. Hydrants, public, 37. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. Steam fire engine is used. FINANCIAL.—Cost, $15,000. Debt: Floating, $8,500; bonded, $6,500, at 6%; due 10 yrs. Expenses, Operating, $1,000. Revenue: Consumers, $300; street sprinkling, $25. MANAGEMENT.—Prest., I. Brenneman; Secy., Emerson Miller; Treas., Chas. Banks. Rept. by L. Brenneman, July 30, '96. SEWERS.—None.

97. **SULLIVAN,** Sullivan Co. (2,222.) Built in '96 by city (see footnote, p. 318). Stand-pipe filled Dec. 12. Engr., J. J. Hainsworth, Indianapolis. Contrs., Howe Pump & Engine Co. Built under laws of '93 and '95, which permit city to own stock in Co., subject to mortgage on water plant. City owns plant through trustees, but pays Co. hydrant rental. SUPPLY.—Busseron Creek, pumping to stand-pipe and direct from impounding reservoir; filtered. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Gordon. "Coal used; av. cost, 25 cts. per short ton." FILTER.—Cap., 500,000 galls.; Jackson. RESERVOIR.—On Busseron Creek, formed by dam. STAND-PIPE.—Cap., 84,600 galls.; steel, 12 × 100 ft. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by taxation or revenue. Taps, 1; made by city for $7, including service to curb. Services, galv. 1.; paid for by city. City can compel use of meters and any consumer may have one. Hydrants, public, 40. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 5%; due in 20 yrs. Rept. by F. M. Cunningham, Dec. 12, '96. SEWERS.—None.

98. **TERRE HAUTE,** Vigo Co. ((30,217.) Built in '73 by Terre Haute Water-Works Co. FRANCHISE.—50 yrs. from '73. City to pay $40 per hydrant per yr. SUPPLY.—Wabash River, pumping direct PUMPS.—Cap., 16,000,000 (?) galls.; 10,000,000 Cornish cond. (rept. previously). Makers rept. 6,000,000 Holly vert. high duty. Bituminous slack used; av. cost, $0.60 per short ton. FILTERS.—Cap., 4,500,000 galls.: 3,500,000 National (New York); 1,000,000 Jewell. RESERVOIR.—Cap., 1,000,000 galls.; storage. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 55 miles. Taps, 2,750; made by Co. for $6. Meters: 150; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 767. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 50 lbs.; fire, 110 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, $500,000. Expenses, Operating, $25,000. MANAGEMENT.—Prest., Frank McKeen; Secy., H. K. Lease; Treas., Jno. A. Cole; Supt., S. S. Williamson. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Aug. 6, '81; National filters, Feb. 7, '91; Jewell filters, May 28, '96; direct pumping system, Aug. 22, '95.

99. **TIPTON,** Tipton Co. (2,697.) Built in '94 by city. Engrs., Voorhees & Witmer, Buffalo, N. Y. Engr., L. V. Gould. Contrs., Bowliss, Porter & Hadley. SUPPLY.—

Wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 McGowan comp. dup. Natural gas used; av. cost, $600 per annum. DISTRIBUTION.—Mains, 6 miles; cost extensions met by city. Taps, 205; made by city for $5. Services, lead; paid for by city to curb. Use of meters optional with Co. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $35,000. Expenses, Operating, $2,500. Revenue, from Nov., '94, to May, '96, $2,328. MANAGEMENT.—Rept. by Supt., J. A. Herman, June 15, '96. SEWERS.—Has sanitary and storm sewers.

100. **UNION CITY,** Randolph Co. (2,681.) Built in '73 by town. SUPPLY.—Two wells, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,000,000 Deane; 1,000,000 Laidlaw-Dunn. Natural gas used; av. cost, $1,000 per year. DISTRIBUTION.—Taps, 600; made by consumer. Services, lead; paid for by consumer. Meters: 34; owned, controlled and repaired by city. Use of meters compulsory for factories, stables, hotels, laundries and R. R. City can compel use of meters and any consumer may have one. Hydrants, public, 121; private, 1. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 40 lbs.; fire, 65 to 100 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $28,000: $15,000 at 5%, $13,000 at 5½%. Expenses, Operating, $2,880. Revenue, metered, $30; street sprinkling, $70. Everything is met by public taxation. MANAGEMENT.—Chn. W.-W. Com., R. J. Clark; Secy., Jas. H. Horney; City Treas., P. A. Taylor; Supt., E. S. Pettis; Pump. Engrs., H. C. Hick and Calvin Smith. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary and storm sewers.

D 1. **UPLAND,** Grant Co. (257.) Built in '92 by Co. for domestic supply. Engr., A. C. Bugher. Supply, well, pumping through small tank or stand-pipe to mains. Pump, cap., 36,000 galls.; Marsh. Gas used; av. cost, $40 per yr. Cost, $5,000. Cap. Stock, paid-up, $2,700; paid no div'd in '95. Debt, $1,400. Expenses, Operating, $200; int., $112. Prest., Geo. W. Jones; Secy. and Supt., Jacob Bugher; Treas., O. L. Stout; Ch. Pump. Engr., Anson C. Bugher. Rept. by Secy., Sept. 8, '96. No sewers.

101. **VALPARAISO,** Porter Co. (5,090.) Built in '85-6 by Valparaiso City Water Supply Co. SUPPLY.—Flint Lakes, pumping direct. Area of lakes, 3 sq. miles. PUMP.—Cap., 1,500,000 galls.; Holly-Gaskill hor. rotative. DISTRIBUTION.—(In '88.) Mains, 12.5 miles; Taps, 304. Services, lead. Meters, 39. Hydrants, 55. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE. (In '89.) Ordinary, 25 lbs.; fire, 55 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock, $45,000. Bonded debt, $55,000, at 6%. Expenses, $8,800: Operating, $5,500; int., $3,300. Revenue, $12,250: Consumers, unmetered, $8,000; City, $4,250. MANAGEMENT.—Prest., S. V. Saleno; Secy. and Treas., H. B. Smith, both of Bay City, Mich.; Supt., Don A. Salver; Ch. Pump. Engr., Jos. Bradley. Rept. by Supt., June 6, '96. SEWERS.—Has sanitary and storm sewers.

102. **VERNON,** Jennings Co. (613.) Built in '95 by city; put in operation Jan. 1, '96. Engr., N. W. Morrel, New Albany. SUPPLY.—River, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Deane dup. Av. cost of coal used, $3.25 per short ton. FILTER.—Water from river filtered through gravel to pump well. STAND-PIPE.—Cap., 19,000 galls.; 8 × 50 ft., on stone foundation on hill. DISTRIBUTION.—Mains, 1 mile; cost extensions met by taxation. Taps, 50; made by city for $6.50. Services, galv. i.; paid for by consumer. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 5,000. FINANCIAL.—Bonded debt, $4,300, at 6%; due '98 until 1907 in amts. of $400 and $500. MANAGEMENT.—Rept. by Clk., Thos. B. Reed, June 15, '96. SEWERS.—None.

103. **VEVAY,** Switzerland Co. (1,663.) Built in '95 by city; put in operation Sept. 20. Engr., Prof. Kennedy, Rockfort. Contrs., Guild & White, Chattanooga, Tenn. No legal difficulties. SUPPLY.—Ohio River, pumping to reservoir. PUMPS.—Cap., 1,175,000 galls.; Deane dup. Bituminous slack used. RESERVOIR.—Cap., 2,000,000 galls. Elev., 168 ft. FISCAL YEAR CLOSED Apr. DISTRIBUTION.—Mains, 4 miles; cost extensions met by consumers. Taps, 117; made for $5. Services, lead or galv. i.; paid for by consumer. Meters: 2; owned by consumer; controlled by city. City can compel use of meters and a consumer may have one. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 79. FINANCIAL.—Cost, $18,000. Bonded debt, $15,500, at 6%. Expenses: Operating, $750. Works are more than paying running expenses. MANAGEMENT.—City Treas., John Deermiller. Rept. by Supt. and Ch. Pump. Engr., Chas. Allen, Aug. 30, '96. SEWERS.—None.

104. **VINCENNES,** Knox Co. (8,853.) Built in '85 by Vincennes Water Supply Co. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city at end of 10 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Wabash River, pumping to stand-pipe. PUMPS.—Cap., 4,000,000 galls.; two Deane comp. cond. Bituminous coal used; av. cost, $1.10 per short ton. STAND-PIPE.—Cap., 568,800 galls.; 22 × 200 ft. (?) FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 18 miles; cost extensions met by income. Taps, 500; made by Co. Services, iron; paid for by consumer. Meters: 20; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 155. CONSUMPTION.—(Galls.) av., 800,000; max., 850,000; min., 400,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $379,000. Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $175,000, at 6%. Expenses: Operating, $17,000; int., $10,500; taxes, $1,000. MANAGEMENT.—

Prest., W. G. Hopper; Secy. and Treas., Walter Wood; Supt., L. J. Weisinberger; Ch. Pump. Engr., Henry Swartz. Rept. by R. D. Wood & Co., Phila., Pa. SEWERS.—None.

105. **WABASH,** Wabash Co. (5,105.) Built in '86-7 by Wabash Water Co. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city at any time after 5 yrs. Rates are fixed in franchise. City to pay $45 each for first 100 hydrants, additional ones at $35 each. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly hor. dup. Fuel gas used; by contract. RESERVOIRS.—Cap., 2,000,000 galls.; two storage. STAND-PIPE.—Cap., 367,200 galls.; iron; 25 x 100 ft. DISTRIBUTION.—Mains, 18 miles; cost extensions met by bonds. Taps, 820; made by Co. for $6. Services, w. i. and lead; paid for by consumer. Meters: 2; owned; controlled and repaired by Co. Co. cannot compel but may prohibit use of meters. Hydrants, public 176. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—Ordinary, 75 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $200,000. Cap. Stock: Authorized, $150,000; all paid-up. Bonded debt, $130,000, at 6%; due 1916. Expenses: Operating, $5,200; taxes, $1,500. Revenue: Consumers, $10,000; City, fire protection, $6,460. MANAGEMENT.—Prest., C. C. Pomeroy; Secy. and Treas., C. E. Kimball; both of 45 Wall St., New York; Supt., W. S. Stitt; Ch. Pump. Engr., Frank Isham. Rept. by H. H. Bowby, 45 Wall St, N. Y. City, June 24, '96. SEWERS.—Has sanitary sewers only.

106. **WALKERTON,** Saint Joseph Co. (885.) Built in '96-7 by Walkerton Water-Works Co.; completed in Feb. SUPPLY.—Pumping to tank. TANK.—Cap., about 38,000 galls. DISTRIBUTION.—Mains, 2¼ miles. Hydrants, 20. MANAGEMENT.—Secy., Wm. Clem. Information partly from press rept.

107. **WARSAW,** Kosciusko Co. (3,574.) Built in '86 by Warsaw Water-Works Co.; rebuilt in '90. Press rept. states works were sold at master's sale, Oct., '95. FRANCHISE.—20 yrs. from '87. Co. is not exempt from local taxes. City to pay $50 per hydrant per annum. No legal difficulties. SUPPLY.—Wells and filtered lake water, pumping to stand-pipe and direct. Lake covers 80 acres. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. West Va. bituminous coal used; av. cost, $2.50 per short ton. FILTERS.—Cap., 500,000 galls.; New York. STAND-PIPE.—Cap., 18,360 galls.; 5 x 125 ft. DISTRIBUTION.—Taps, made by Co. for $1. Services, iron; paid for by consumer. Hydrants, public, 62. CONSUMPTION.—(Galls.) av., 500,000; max., 1,000,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 lbs. FINANCIAL AND MANAGEMENT.—See Shelbyville. Rept. by Supt., John G. Sutton, New York, July 30, '96. SEWERS.—Has sanitary and storm sewers.

108. **WASHINGTON,** Daviess Co. (6,064.) Built in '88 by Washington Water-Works Co. FRANCHISE.—25 yrs. from '88; provides for purchase of works by city at end of 10 yrs. or any 5 yrs thereafter. No legal difficulties. SUPPLY.—West Fork of White River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,500,000 galls.; 1,000,000 and 1,500,000 Holly hor. dup. Bituminous run of mine coal used; av. cost, $1 per short ton, delivered. FILTERS.—Stone wall filled with gravel. STAND-PIPE.—Cap., 350,000 galls.; iron; 20 x 100 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8 to 10 miles. Taps, 600; made by consumer for $1. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 150. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,500,000; min., 750,000. PRESSURE.—Ordinary, 54 lbs.; fire, 78 lbs. FINANCIAL.—Cost (in '88), $130,000. Bonded debt (in '88), $115,000, at 6%. Expenses: Operating, $4,425; int., $9,685; taxes, $341. Revenue, $13,763: Consumers, unmetered, $7,885; metered, $338; City, fire protection, $4,190; other purposes, $1,350. MANAGEMENT.—Prest., J. F. Moffett; Secy., F. B. Roblin; Treas., C. T. Moffett, all of New York; Supt., Thos. J. Axtell. Rept. by Secy. and Supt., Aug. 28, '96. SEWERS.—Has storm sewers only.

109. **WEST INDIANAPOLIS** (P. O., Indianapolis), Marion Co. (3,527.) Built in '91 by Indianapolis Water Co. FRANCHISE.—30 yrs. from '91; provides for purchase of works by city in 5 yrs. Rates are fixed in franchise and are subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per hydrant. No legal difficulties. SUPPLY.—Indianapolis Works. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 6½ miles. Taps, 98; made free. Services, lead; paid for by property owner. Meters: 2; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for manufacturers. Hydrants, public, 50; private, 8. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Revenue, City, fire protection, $2,500. MANAGEMENT.—Indianapolis Water Co. Rept. by Supt., F. A. W. Davis.

110. **WEST LAFAYETTE** (P. O., Lafayette), Tippecanoe Co. (1,242.) Built in '94 by Co.; put in operation Jan. 1, '95. Engr., John W. Hill, Cincinnati, O. Contr., John O. Heaton, Junction City, Kan. FRANCHISE.—Exclusive for 50 yrs. from '95. Provides for purchase of works by city at end of 10 yrs., price to be determined by agreement or arbitration. Max. rates are fixed in franchise and subject to revision, if necessary, at end of 10 yrs. "so as to conform with prices charged in towns of like size and situation in this state that are furnished with the same system of water-works." City to pay $900 per yr. for 20 hydrants, with right to use same for fire purposes, "flushing sewers, and also gutters when necessary for the preservation of public health;" city to pay $45 each per yr. for one hydrant to each 1,000 ft. of extensions ordered by it. SUPPLY.—

Four driven wells on bank of Wabash River, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Smith-Vaile & Stillwell-Bierce comp. dup. Brazil block and slack used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 380,000 galls.; steel; 36 × 50 ft. FISCAL YEAR CLOSED Jan. 1, '97. DISTRIBUTION.—Mains, 5 miles. Taps, 282; made by Co. free. Services, ¾-in. galv. i.; paid for by Co. Meters: 13; owned by property owner; controlled by Co. Co. cannot compel but may prohibit use of meters. Hydrants, public, 21; private, 6 (Purdue University). CONSUMPTION.—(Galls.) av., 100,000; max., 390,000; min., 60,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $61,000. Cap. Stock: Authorized, $50,000; paid-up, $29,000. Debt, $45,000: Floating, $15,000, at 7%; bonded, $30,000, at 6%, due in 1904. No sinking fund. Expenses, $4,140: Operating, $2,200; int., $1,800; taxes, $140. Revenue, $3,215: Consumers, unmetered, $1,950; metered, $320; City, fire protection, $945. MANAGEMENT.—Prest., E. B. Vawter; Secy. and Supt., H. G .P. Jennings, both of Lafayette; Treas., Chas. Terry; Ch. Pump. Engr., Alex. E. Mathieson. Rept. by Prest., Jan. 3, '97. SEWERS.—None.

111, P 6. **WHITING,** Lake Co. (1,408.) Built in '90 by Standard Oil Co.; put in operation in July. No legal difficulties. SUPPLY.—Lake Michigan, pumping direct. Intake, 5-ft. tunnel. PUMPS.—Cap., 25,000,000 galls.; 5—5,000,000 Blake. Indiana mine run bituminous coal used. DISTRIBUTION.—Services, iron. Water is furnished free to employees of the Standard Oil Co. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 15,000,000. PRESSURE.—Ordinary, 20 lbs.; fire, 80 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. A. Moffett. Rept. by Supt., W. M. Burton, June 17, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Attempts to avoid anchor ice at intakes and construction of intake. Eng. News, July 5, '94.

PROJECTED WORKS.

Application for franchise was made in Jan., '97, by Geo. H. Storey, La Porte. Supply, Lake Michigan, by means of pumps with cap. of at least 2,000,000 galls. Hydrants, 40.

F 1. **WOLCOTTVILLE,** Lagrange Co. (Est., 837.) Built in '89 by Walcottville Water-Works Co. for fire protection.

MICHIGAN.

1. **ADRIAN,** Lenawee Co. (8,756.) Built in '88-4 by Adrian Water-Works Co.; now in hands of receiver (see note.) FRANCHISE.—30 yrs.; provides for purchase of works by city. Rates are not fixed in franchise. LEGAL DIFFICULTIES.—Oct. 8, '95, Cy. Clk. rept. that "for not furnishing the (stipulated?) quality the (hyrant?) rental has been reduced 50%, in accordance with agreement in contract." Press repts. a few days earlier stated that city first passed resolution declaring franchise forfeited, but afterwards, accepted suggestion of Co. and cut rental one-half. SUPPLY.—Surface and artesian wells, pumping direct. Surface well is 24.6 × 28 ft. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly-Gaskill hor. high-duty. DISTRIBUTION.—(In '88.) Mains, 15 miles. Taps, 400. Meters, 5. Hydrants, 120. CONSUMPTION.—(Galls.) av., 450,000. FINANCIAL.—(In '88.) Bonded debt, $145,000, at 7%. Expenses, $14,650: Operating, $4,500; int., $10,150. Revenue, $14,000: Consumers, $4,000; City, fire protection, $10,000. NOTE.—Inquiry returned indorsed: "no change since last rept., except is in hands of a receiver." Feb., '96. Jno. A. Cole, Chicago, rept. he had been engaged by receiver to make plans for remodeling system. REFERENCE.—Eng. News, Nov. 22, '84.

2. **ALBION,** Calhoun Co. (3,763.) Built in '89 by city; put in operation Jan. 1, '90. SUPPLY.—Two 6-in. wells, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Hughes. STAND-PIPE.—Cap., 106,000 galls.; 12 × 128 ft. DISTRIBUTION.—Mains, 9 miles. Taps, 300. Hydrants, 68. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $50,000. Debt, $50,000; int., 6%. Expenses: Operating, $1,700. Revenue: Consumers, $1,500. NOTE.—No rept. since '90-1 Manual.

3. **ALLEGAN,** Allegan Co. (2,669.) Built in '71 by village. SUPPLY.—Well, 24 ft., in diam., on bank of Kalamazoo River, pumping direct. PUMPS.—Cap., 1,125,000 galls.; Walker, water-power. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 6¼ miles; cost extensions met by tax or revenues. Taps, 531; made by consumer. Services, iron; paid for by consumer. Use of meters optional with consumer. Hydrants, public, 59. CONSUMPTION.—(Galls.) av., 511,220; max., 990,000; min., 400,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost (in '90), $40,000. Expenses: Operating, $1,500. Revenue, $2,800. MANAGEMENT.—Prest. of Village, H. H. Pope; Clk., Ed. J. Wager. Rept. by Supt., Morris Dyer, July 9, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Jan. 28, '82.

4. **ALMA,** Gratiot Co. (1,655.) Built in '82 by village. SUPPLY.—Pine River, pumping direct. PUMPS.—Cap., 1,750,000 galls.; 2—500,000 Walker, water-power; 750,000 Smith & Vaile. DISTRIBUTION.—(In '88.) Mains, 4 miles. Taps, 50. Meters, 0. Hydrants, 35. FINANCIAL.—(In '88.) Cost, $15,000. Bonded debt, $8,000, at 6%. Expenses, $1,480: Operating, $1,000; int., $480. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, May 17, '84.

5. **ALPENA,** Alpena Co. (11,283.) Built in '79 by Alpena City Water Co. FRANCHISE.—30 yrs. from '79. Provided for purchase of works by city in '94; price to be determined by arbitration, according to state law. Rates are to be an average of Detroit, Port Huron and Bay City. Co. is exempt from local taxes. City to pay for 80 hydrants at $80 per yr. and $40 each for additional ones. No legal difficulties. SUPPLY.—Thunder Bay River and Lake Huron, pumping direct. PUMPS.—Cap., 3,000,000 galls.; four Walker and 2,000,000 Holly rotary, water power. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 22½ miles; cost extensions met by Co. Taps, 1,750; made by consumer. Services, lead; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 132. CONSUMPTION.—(Galls.) av., 1,500,000; max., 2,000,000; min., 1,300,000. PRESSURE.—Ordinary, 30 lbs.; fire, 100 lbs. One steam fire engine is kept in reserve. FINANCIAL.—Cap. Stock: Authorized, $75,000; all paid-up; bonded debt, $67,500, at 7%. Sinking Fund, none. Expenses: Operating, $7,500. Revenue: Consumers, $12,000; City, fire protection, $8,500. MANAGEMENT.—Prest. and Supt., W. H. Johnson; Treas., A. W. Comstock; Ch. Pump. Engr., Robt. Oliver. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Mar. 11, '82.

6. **ANN ARBOR,** Washtenaw Co. (9,431.) Built in '85-6 by Ann Arbor Water Co. Went into hands of a receiver Sept. 11, '93. FRANCHISE.—30 yrs. from '86; provides for purchase of works by city at any time, by paying their full value. Rates must be reasonable. Co. is not exempt from local taxes. City to pay $4,500 per yr. for 100 hydrants and $40 for each additional (press abstract of rept. of Council Com. on contract). No legal difficulties. SUPPLY.—Flowing wells and springs, pumping to reservoir. PUMPS.—Cap., 5,000,000 galls. 1,500,000 Knowles; and 2,000,000 Gordon; 1,500,000 Deane comp. dup., added latter part of '96. Bituminous coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 2,500,000 galls.; elev., 190 ft. DISTRIBUTION.—Mains, 32 miles. Taps, 1,740; made by Co. for $10. Services, iron; paid for by property owner. Meters, 90; owned, controlled and repaired by Co.; yearly rental, 15%. Co. can compel use of meters and any consumer may have one. Hydrants, public, 135; private, 2. CONSUMPTION.—(Galls.) av., 1,024,000; max., 2,000,000; min., 700,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $300,000. Debt, $215,000: Floating, $45,000, at 6%; bonded, $170,000, at 6%. Expenses: Operating, $8,000; taxes, $700 to $800. MANAGEMENT.—Rept. by Receiver, A. K. Hale, June 5, '96. SEWERS.—Has sanitary sewers.

7. **AU SABLE,** Iosco Co. (4,328.) Built in '85 by town. City owns the distribution system and lets contract for pumping. SUPPLY.—Lake Huron, pumping direct. PUMPS.—(In '89.) Cap., 1,440,000 galls.; two Walker. Refuse from saw mill used for fuel. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Taps, made by consumer for $3. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 40; private, 16. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—(In '90.) Cost, $35,000. Floating debt, $7,000. Expenses, $1,800. Revenue, $1,500. Rept. by W. F. Bisbee, June 5, '96. SEWERS.—None.

8. **BAD AXE,** Huron Co. (842.) Built in '94 by village; put in operation Aug. 1. Engr., A. L. Holmes, Bay City. Contrs., Michigan Pipe Co., Bay City. SUPPLY.—Three 6-in. wells, 200 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Dean Bros. dup. Wood used; av. cost, 70 cts. per cord. STAND-PIPE.—Cap., 85,000 galls.; steel; 12 × 100 ft. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2¾ miles; cost extensions met by general fund. Taps, 112; made by village for $5. Services, w. i.; paid for by consumer. Meters: 9; owned and controlled by village. Village can compel use of meter and any consumer may have one. Use of meters compulsory for manufacturers and large private consumers. Hydrants, public, 29; private, 1. CONSUMPTION.—(Galls.) av., 33,000. PRESSURE.—Ordinary, 43 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $15,500. Bonded debt, $15,000, at 5%. Expenses: Operating, $800; int., $826. Deficits are met to full extent by taxation. MANAGEMENT.—Rept. by Ch. Pump. Engr., Jno. G. Kundinger, June 17, '96. SEWERS.—Has partial system of storm sewers.

9. **BATTLE CREEK,** Calhoun Co. (13,197.) Built in '87 by city. SUPPLY.—Goguac Lake, pumping to stand-pipe. Lake has area of 360 acres; drainage area, 1½ sq. miles; 80 ft. above, two miles from business part of town. Lake can be supplemented by Minges Brook; drainage area, 14 sq. miles. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Blake comp. cond. dup. Hocking Valley (O.) bituminous lump coal used; av. cost, $3.05 per short ton, two miles wagon haul. STAND-PIPE.—Cap., 143,000 galls.; 18 × 75 ft.; 200 ft. above business part of town. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 28.2 miles; cost extensions met by taxation or bonds. Taps, 1,669; made by city for $5, advance on water rental. Services, lead and galv. i.; paid for by city to curb. Meters: 990; owned by city and consumer; controlled and repaired by city; yearly rental, 15% of cost. Use of meters compulsory for all business places and new consumers. City can compel the use of meters and any consumer may have one. Hydrants, public, 287; private, 35. CONSUMPTION.—(Galls.) av., 706,000; max., 2,000,000; min., 300,000. PRESSURE.—Ordinary, 65 to 85 lbs. One steam fire engine is owned but seldom used. FINANCIAL.—Cost, $240,889. Bonded debt, $100,000, at 4½%; due '96 to 1905; $10,000 yearly. $30,000, at 5%; due 1915 to '17, $1,000 yearly. Sinking Fund, none. Expenses: Operating, $8,053. Revenue: Consumers, unmetered, $4,814; metered, $9,901. Extensions, enlargements and int. are paid by taxation. MANAGE-

MENT.—Prest., S. O. Bush; Secy., W. C. Gage; Supt., W. W. Brigden; Ch. Pump. Engr., Geo. Van Valen. Rept. by Supt., June 16, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Meters, Eng. News, Mar. 22, '94.

10. **BAY CITY,** Bay Co. (27,839.) Built in '72 by city. SUPPLY.—Saginaw Bay, arm of Lake Huron, pumping direct. Intake conduit, 30-in. wood, 21,186 ft. long. PUMPS.—Cap., 12,500,000 galls.: 2—2,500,000 Holly, rotary; 2,500,000 Holly quadruplex; 5,000,000 Holly-Gaskill hor. high duty. Ohio bituminous slack used; av. cost, $2 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 44 miles; cost extensions met by income. Taps, 1,851; made by city at $3 for ½-in., $3.50 for ⅝-in., $4 for ¾-in. and $5 for 1-in. Services, lead; paid for by consumer. Meters: 559; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for manufacturers and elevators. City can compel use of meters and any consumer may have one. Hydrants, public, 387; private, 28. CONSUMPTION.—(Galls.) av., 3,074,968; max., 4,394,027; min., 2,550,438. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $562,885. Debt, bonded, $362,000: $267,000, at 8%; due '96 to 1913; $20,000, at 4%; due 1920 and $75,000, at 5%; due 1906 to '18. Sinking Fund, none. Expenses: Operating, $22,068; int., $27,110. Revenue: Consumers, unmetered, $11,584; metered, $10,822; City, fire protection, none. Int. on bonded debt paid by general tax. MANAGEMENT.—Prest., Andrew Walton; Secy. and Supt., E. L. Dunbar; Treas., L. Daniels; Ch. Pump. Engr., A. B. Verity. Rept. by Supt., June 3, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 16, '81.

F 1. **BELDING,** Ionia Co. (1,730.) Built in '93 by city. City owns pipe and hires pumping. Contrs., Michigan Pipe Co., Bay City. Supply, Flat River, for fire protection only, pumping direct. Cost, $6,000. Bonded debt, $6,000. Expenses: Operating, $20 per mo. for pumping. Secy., Henry Freedly; Supt., Wm. T. Pope. Rept. by C. R. Cowdin, Cy. Clk., June 19, '96. Has partial system of storm sewers.

11. **BELLAIRE,** Antrim Co. (Est., 716.) Built in '88 by Robt. Rickardi; incorporated as Bellaire Water Supply Co. Rates are not subject to regulation by city. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—One Holly comp.; two Knowles single pumps, run by water wheel under 8-ft. head. RESERVOIR.—Cap., 200,000 galls.; elev. 200 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (In '90.) 2 miles. Taps, 200. Services, ½-in. Hydrants, public, 18. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $15,000. MANAGEMENT.—Prest., Robt. Rickardi; Secy. and Treas., F. B. Moore. Rept. by Supt., Henry Rickardi.

12. **BENTON HARBOR,** Berrian Co. (3,692.) Now owned by city. Built in '91 by Benton Water Supply Co.; put in operation Aug. 1. SUPPLY.—Tube wells, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; Hughes comp. dup. Worthington. Fuel oil used. STAND-PIPE.—Cap., 84,600 galls.; iron; 12 × 100 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 17¼ miles. Services, lead; paid for by property owner. Meters: 12; owned, controlled and repaired by city. Use of meters optional with Co.; compulsory for saloons, laundries, livery stables and hotels. Hydrants, public, 75. PRESSURE.—Ordinary, 50 to 75 lbs. FINANCIAL.—Cost, $96,500. Bonded debt, $92,500. MANAGEMENT.—Bd. of Pub. Wks. Secy. and Supt., R. P. Chaddock. Rept. by Supt., Oct. 2, '96. SEWERS.—Has sanitary and storm sewers.

13. **BESSEMER,** Gogebic Co. (2,566.) Now owned by city; built in '87-8 by Gogebic Water & Gas Supply Co. SUPPLY.—Pumping from mines about 300 ft. to tank. PUMPS. Cap., 1,750,000 galls.; 1,000,000 and 750,000 Worthington, latter non-comp. high pressure. TANK.—Cap., 132,200 galls.; 30 × 25 ft., on elev. 387 ft. above city. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 7 miles; cost extensions met by taxation. Taps, 110; made by city for $12. Services, galv. i.; paid for by property owner. Meters: 15; owned, controlled and repaired by city. Use of meters compulsory for saloons, stores and eating houses. City can compel use of meters and any consumer may have one. Hydrants, public, 43. CONSUMPTION.—(Galls.) av., 40,000; max., 60,000; min., 30,000. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $35,000, at 6%; due '97 to 1906. Sinking Fund: $3,000. Expenses: Operating, $3,900; int., $2,100. Revenue, $1,300. Deficits are met by general taxation. MANAGEMENT.—Prest., F. B. Jones; Secy., Gustav L. Ziebur; Treas., Otto B. Olson; Supt., G. T. Williams. Rept. by Secy., Aug. 11, '96. SEWERS.—Has sanitary sewers only.

14. **BIG RAPIDS,** Mecosta Co. (5,303.) Built in '71 by town. SUPPLY.—Driven wells, pumping direct from collecting reservoir. PUMPS.—(In '89) Cap., 3,500,000 galls.; 1,000,000 Holly quarter-crank and 2—1,500,000 Holly hor. water-power. RESERVOIR.—(In '89.) Cap., about 30,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, 550. Services, lead. Meters, 0. Hydrants, public, 74. CONSUMPTION.—(Galls.) av., 1,200,000. PRESSURE.—(In '89.) Ordinary, 65 lbs.; fire, 100 lbs. MANAGEMENT.—Bd. of Pub. Wks. Rept. by Supt., H. E. Hardy, Sept. 26, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Mar. 25, '82.

15. **BIRMINGHAM,** Oakland Co. (899.) Built in '90 by village; put in operation Sept. 1. SUPPLY.—Flowing wells, pumping direct from receiving reservoir. PUMPS.—Cap., 1,500,000 galls.; Hughes. Wood used; av. cost, $1.75 to $2 per cord and bituminous coal at $2.85 per short ton. DISTRIBUTION.—Mains, 4 miles. Taps, 180; made by village for $5. Use of meters optional with consumer. Hydrants, public, 45. FINAN-

CIAL.—Cost, $19,000. Bonded debt, $17,000, at 5%; $1,000, at 5½%; due '98; $2,000, at 5½%; $1,000 at 5½%; due '96. Works are self-sustaining. MANAGEMENT.—Prest., A. Whitehead; Village Clk., E. R. Smith; Treas., D. M. Johnston. Rept. by Clk., June 8, '96. SEWERS.—None.

16. **BUCHANAN,** Berrien Co. (1,994.) Built in '93 by city. Engr., Peter English, Benton Harbor. SUPPLY.—Springs, pumping direct. PUMPS.—Two Walker. Bituminous coal used; av. cost, $3.50 per short ton. DISTRIBUTION.—Meters, 0. Hydrants, public, 30. PRESSURE.—Ordinary, 60 lbs.; fire, 80 to 90 lbs. One steam fire engine is used. MANAGEMENT.—Ch. Pump. Engr., E. Myler. Rept. by W. O. Churchill, Dec. 12, '96. SEWERS.—No sanitary sewers.

17. **CADILLAC,** Wexford Co., (4,461.) Now owned by Cadillac Water Co. Built in '78 by individuals or Co. Contrs., Lansing Iron & Engine Works. FRANCHISE.—30 yrs. from '92. Rates are fixed in franchise. Co. is not exempt from local taxation. City to pay $3,500 per yr. at present. No legal difficulties. SUPPLY.—Clam Lake, pumping direct. PUMPS.—Cap., 5,000,000 galls.; one 2,000,000 Holly hor. dup.; 2—1,500,000 Worthington non-comp. high pressure. Slabs, sawdust and refuse from sawmill used as fuel. STAND-PIPE.—Cap., 188,000 galls.; steel, 20×80 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 10½ miles; cost extensions met by rentals. Taps, 732; made by Co. Services, galv. i.; paid for by Co. to curb at an av. cost of $6.17. Use of meters not optional with Co. Hydrants: public, 75; private, 8. CONSUMPTION.—(Galls.) av., 905,975; max., 2,365,821; min., 331,462. PRESSURE.—Ordinary, 60 lbs.; fire, 80 to 140 lbs. FINANCIAL.—Cost, $70,081. No debt. Expenses: Operating, $3,205; taxes, $881. Revenue, $12,036. Consumers, unmetered, $6,450; City, fire protection, $3,500; other purposes, $2,086. MANAGEMENT.—Prest., W. W. Cummer; Secy. and Treas., N. V. Gerrish; Supt. and Engr., G. D. Westover. Rept. by Secy., June 5, '96. SEWERS.—Has sanitary sewers only.

126. **CALUMET,** Houghton Co., (1,159.) See Red Jacket.

F 2. **CAPAC,** Saint Clair Co. (Est., 530.) Built in '87-8 by village, for fire protection only. Supply, Driven well, pumping to 15,000-gall. tank. Mains, 1,100 ft. Taps, 4. Hydrants, 3. Cost, $1,100. No rept. since '89-90 Manual.

18. **CARO,** Tuscola Co. (1,701.) Built in '88 by Caro Water-Works Co. FRANCHISE.—30 yrs. from '88; provides for purchase of works by city in '98. Rates are fixed in franchise. Co. is exempt from local taxes. City to pay $1,500 per yr. for fire protection. No legal difficulties. SUPPLY.—Springs, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls. Deane. Wood used. RESERVOIR.—Cap., 1,000,000 galls.; at pump house. STAND-PIPE.—Cap., 275,000 galls.; iron; 25 × 75 ft. on hill 85 ft. high. DISTRIBUTION.—Mains, 6 miles. Taps, 200. Services, galv. i.; paid for by consumer. Meters: 30; owned by consumer; yearly rental $3. Co. can compel use of meters and any consumer may have one. Hydrants, public, 28; private, 2. CONSUMPTION.—(Galls.) av., 25,000; max., 125,000; min., 15,000. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $42,000. Cap. Stock, authorized, $25,000. Bonded debt, $25,000, at 6%; due 1918. MANAGEMENT.—Prest., Geo. W. Phelps. Rept. by Secy., C. O. Thomas, June 1, '96. SEWERS.—None.

19. **CARSON CITY,** Montcalm Co., (921.) Built in '88 by village. SUPPLY.—Fish Creek, pumping to tank, and direct for fire. PUMP.—Cap., 1,500,000 galls.; Smith & Vaile. TANK.—Cap., 50,000 galls. FISCAL YEAR CLOSED Apr. 22. DISTRIBUTION.—Mains, 1 mile. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 15,000. FINANCIAL.—Cost, $14,000. Debt, $11,000. Expenses, $450. MANAGEMENT.—Water Comr., J. W. Waters. Rept. by Clk., A. B. Goodwin, Sept. 21, '96.

20. **CASSOPOLIS,** Cass Co. (1,369.) Built in '92 by city. Des. Engr., W. S. Parker, Pontiac. Contrs., Lansing Engine & Iron Works. SUPPLY.—Pumping (direct?). PUMPS.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon, (rept. by makers). FINANCIAL.—Contract price about $10,000. NOTE.—Above mostly from press repts.; subject to revision.

21. **CEDAR SPRINGS,** Kent Co., (1,035.) Built in '89 by village. SUPPLY.—Well and creek, pumping direct. PUMP.—Cap., 750,000 galls.; Smith & Vaile. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 2½ miles. Hydrants, public, 14; private, 100. FINANCIAL.—Bonded debt, $5,000, at 6%. Expenses, $1,000. Revenue, $650. MANAGEMENT.—Prest., W. C. Congdon. Rept. by V. A. Pool, Vill. Clk., Sept. 26, '96.

22. **CENTERVILLE,** Saint Joseph Co., (775.) Built in '96 by H. J. Hampson & Co. for general use. SUPPLY.—Well, pumping direct. DISTRIBUTION.—Mains, ½ mile. FINANCIAL.—Cost, $2,000. MANAGEMENT.—Rept. by owners, July 29, '96. NOTE.—Press rept., Jan. 5, '97, stated owners had offered to turn plant over to city for $834 and that election had been ordered.

23. **CHARLEVOIX,** Charlevoix Co. (1,496.) Built in '92 by village. Put in operation in Dec. Engr., Geo. L. Wells, Grand Rapids. SUPPLY.—Three flowing wells, 400 and 260 ft. deep, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Worthington non-comp. high pressure. Wood used; av. cost, $2 per cord. DISTRIBUTION.—Taps, 300; made by consumer for $4. Services, galv. i.; paid for by consumers. Meters, 0. Hydrants, public, 50; private, 2. CONSUMPTION.—(Galls.) av., 200,000; max., 400,000; min., 180,000. PRESSURE.—Ordinary, 50 lbs., fire, 140 lbs. FINANCIAL.—

Cost, $30,000. Bonded debt, $25,000, at 5%; due 1912. MANAGEMENT.—Prest., Willard A. Smith; Secy., H. S. Harsha. Rept. by Supt., Robert O'Neill, Sept. 18, '96.

24. **CHARLOTTE,** Eaton Co. (3,867.) Built in '86-7 by town. SUPPLY.—Wells, pumping direct. PUMPS.—(In '89.) Cap., 3,000,000 galls. 2—750,000 Walker, others not given. Bituminous coal used; av. cost, $3 per short ton. FISCAL YEAR CLOSED May 10. DISTRIBUTION.—Mains, 12 miles; cost extensions met by city. Taps, 739; made by city for $5 and $7, including 60 ft. and 100 ft. service. Services, lead; paid for by property owners. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 80; private, 2. CONSUMPTION.—(Galls.) av., 306,850. PRESSURE.—Ordinary, 40 lbs.; fire, 160 lbs. Steam fire engines are used. FINANCIAL.—Cost, $40,000. Bonded debt (in '90), $40,000, at 6%. Expenses (in '90), $4,200. Revenue (in '90, $4,540: Consumers, $3,300; City, fire protection, $1,240. MANAGEMENT.—Prest., D. L. Tremaine; Secy., C. S. Barrett; Treas., F. E. Leiter; Supt., G. W. Richardson; Ch. Pump. Engrs., F. Knowles and R. Bennett; Rept. by Supt., June 12, '96. PROJECTED IMPROVEMENTS.—New Pumps.

25. **CHASE,** Lake Co. (388.) Built in '83 by village. SUPPLY.—Pere Marquette River, pumping direct. PUMP.—Holly. DISTRIBUTION.—(In '88.) Mains, 1 mile. Taps, 20. Meters, 0. Hydrants, 4. FINANCIAL.—(In '88.) Cost, $11,000. Debt, $1,500. Expenses, $605: Operating, $500; int., $105. NOTE.—No rept. since '90-1 Manual.

26. **CHEBOYGAN,** Cheboygan Co. (6,285.) Built in '82 by city. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 5,280,000 galls.: 3,000,000 Stilwell-Bierce & Smith-Valle, and 2—1,140,000 Walker. Pine slabs used. FISCAL YEAR CLOSED Mar. 7. DISTRIBUTION.—Mains, 9¾ miles; cost extensions met by bonds or tax. Taps, 825; made by city for $2.50. Services, lead; paid for by consumer. Meters: 5; owned, controlled and repaired by city. Use of meters compulsory for brewery, livery stable and school. City can compel use of meters and any consumer may have one. Hydrants, public, 66. CONSUMPTION.—(Galls.) av., 441,000; max., 530,000; min., 305,000. PRESSURE—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $90,000. Bonded debt, $33,000, at 5%; due 1914; $21,000, at 5½%; due '96 to 1900. No sinking fund. Expenses, $8,577: Operating, $4,128; int., $2,228; taxes, $2,221; Revenue, $11,300: Consumers, unmetered, $3,000; City, fire protection, $3,300; sewer flushing, $50. Other purposes, $5,000. MANAGEMENT.—Chn., J. H. Little; Secy., Geo. N. Case; Ch. Pump. Engr., Alex. McKay. Rept. by Secy., July 10, '96. PROJECTED IMPROVEMENTS.—Increased supply. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 3, '84.

F 3. **CHELSEA,** Washtenaw Co. (1,356.) Built in '96 by F. P. Glazier for fire protection. Supply, wells and springs, pumping to reservoir. Press rept. states village has contracted to pay $91.25 per month for fire protection.

27. **CHESANING,** Saginaw Co. (1,056.) Combined water and light plants built in '95 by village, put in operation July 4. Engr. and Contr., T. C. Brooks, Jackson. SUPPLY.—Four 6-in. flowing wells and river as auxiliary, pumping direct. PUMPS.—Fairbanks, Morse & Co., comp. dup. Bituminuous coal used; av. cost, $2.50 per short ton. DISTRIBUTION.—Mains, 2½ miles. Taps, 30; made by village for $5 for streets 66 ft. wide and 10 cents extra for each additional foot. Services, lead; Meters, 0. Hydrants, public, 22. FINANCIAL.—Cost, $14,500. Revenue, Consumers, $100; public buildings, $25. MANAGEMENT.—Prest., E. T. Long; Secy., A. A. Quigley; Treas., A. Cantwell; Supt., Henry Stuart; Ch. Pump. Engr., Wart Stuart. Rept. by Secy., June 18, '96. SEWERS.—Has storm sewers only.

28. **CLARE,** Clare Co. (1,174.) Now controlled by H. J. Doherty, built in '86 by town; CONTRACT.—20 yrs. from '95. Rates are subject to regulation of city. Owner is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Wells and river, pumping direct. PUMPS.—Cap., 2,160,000 galls.; 2—500,000 Walker; others not given. Wood used for fuel; av. cost, 90 cts. per cord. FISCAL YEAR CLOSED, Dec. 31, '95. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by city. Taps made by owner. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 25; private, 4. CONSUMPTION.—(Galls.) av., 720,000; max., 900,000; min., 400,000. PRESSURE.—Ordinary, 20 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $20,000. MANAGEMENT.—Prest. and Treas., A. J. Doherty; Secy., C. H. Clark; Supt., S. A. Gleason; Ch. Pump. Engr., A. Du Bois. Rept. by Prest., June 4, '96. SEWERS.—Has sanitary and storm sewers.

29. **COLDWATER,** Branch Co. (5,247.) Built in '90-1 by city; put in operation March 1. SUPPLY.—Ten 6-in. driven wells, 50 ft. deep, pumping direct. PUMPS.—Cap., 8,000,000 galls; 2—1,500,000 Hughes comp. Hocking Valley lump coal used; av. cost, $2.60 per short ton. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 16 miles; cost extensions met by income of water and light depts. Taps, 770; made by city for $5. Services, black 1.; paid for by city as far as service cock. Meters, 6; owned, controlled and repaired by city. Use of meters compulsory for some manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 108; private, 1. CONSUMPTION.—(Galls.) av., 874,819; max., 1,500,000; min., 150,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $81,798. Bonded debt, $70,000, at 5%; $7,000 due yearly from 1901 until paid. Expenses, Operat-

ing, $3,500. Revenue, $8,883: Consumers, $4,233; City, fire protection, $3,997. No deficits. MANAGEMENT. — Prest., E. R. Root; Secy., H. A. Close; Treas., W. E. Hodgeman; Supt., L. A. Dillingham; Ch. Pump. Engr., Martin Manneron; Rept. by Supt., June 4, '96. SEWERS.—Has partial system of storm sewers only.

30. **CONSTANTINE,** Saint Joseph Co. (1,346.) Built in '78 by town. SUPPLY.—Fawn River, pumping direct. FISCAL YEAR CLOSED Mar. 3. DISTRIBUTION.—Mains, 5.3 miles. Taps, 228. Hydrants, public, 54. FINANCIAL.—Cost, $22,800. Bonded debt, $6,000, at 5%. Expenses, $550: Operating, $250; int., $300. Revenue, Consumers, unmetered, $912. MANAGEMENT.—Common Council. Prest., S. J. Heimbach; Secy., Walter Ferguson; Rept. by Prest., Oct. 7, '96. REFERENCE.—Eng. News, Nov. 18, '82.

P 1. **CORUNNA,** Shiawassee Co. (1,382.) Oct., '95, W. A. Knight, Cy. Clk., rept. $30,000 bonds for works had veen voted. Press rept., March, '96, stated Mayor refused to sign bonds on account of financial condition of town and urged annexation to Onosso. Dec. 14, '96, Frank H. Rose rept. people had twice voted for water and electric lights; that water would not be introduced before '98; that light would come first.

31. **CROSWELL,** Sanilac Co. (504.) Built in '95 by village; put in operation Dec. 7; Engr. & Contr., Geo. W. Wells. SUPPLY.—Wells and river, pumping to tank. PUMP.—Walker. TANK.—Cap., 14,000 galls.; wood, 80 ft. high. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by village. Taps, 28; made by village. Services, ¾-in. iron; paid for by consumers. Hydrants, public, 21. CONSUMPTION.—(Galls.) av., 8,000. PRESSURE.—Ordinary, 38 lbs.; fire, 80 lbs. FINANCIAL.—Expenses, Operating, $750. MANAGEMENT.—Prest., J. P. Niggerman; Secy., Jno. Dexter; Treas., David Wise; Supt., Chas. Hanson; Rept. by Supt., Oct. 25, '96. SEWERS.—Has storm sewers.

32. **CRYSTAL FALLS,** Iron Co. (Township, 1,176.) Now under the management of C. T. Roberts on contract expiring Jan. 1, '97. Built in '89-90 by village. SUPPLY.—Collecting reservoir and small stream, pumping direct. PUMPS.—Cap., 1,000,000 galls.; Ruffalo comp. dup. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 1½ miles. Taps, 30. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $20,000 (in '90). Bonded debt, $18,000, at 6%. MANAGEMENT.—Rept. by Vill. Clk., J. C. Wilkinson, Sept. 29, '96.

33. **DECATUR,** Van Buren Co. (1,109.) Built in '95 by village; put in operation Aug. 9, Engrs., Alvord & Shields, The Rookery, Chicago. Contr., James Pearl, Benton Harbor. SUPPLY.—Two 6-in. wells, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Worthington simple high pressure. Wood used; av. cost, $1.20 per cord. STAND-PIPE.—Cap., 50,000 galls.; 12 × 55 ft., in brick tower 60 ft. high. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxation. Taps, 102. Services, galv. i.; paid for by consumer. Meters, 0. Can compel use of meters and any one may have one. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 58 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $12,000, at 5%. Expenses, Operating, $800 to $900. MANAGEMENT.—Prest., N. E. Hooper, Secy., E. J. Rawson. Rept. by Prest., July 3, '96. SEWERS.—None.

34. **DETROIT,** Wayne Co. (205,876.) Bought by city in '36 for $20,500; built in '27 by Rufus Wells, who afterwards organized Hydraulic Co. City will probably sell water to Highland Park, which see. SUPPLY.—Detroit River, pumping direct. PUMPS.—Cap., 96,000,000 galls.; 3—24,000,000 beam comp. and 24,000,000 Allis triple exp. Crude oil used. STAND-PIPE.—Abandoned and relief valves substituted for it. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 501 miles; cost extensions met by rentals. Taps, 48,918, made by city at $1.75 for ¾-in. and $3 for 1-in. Services, lead; paid for by consumer. Meters: 4,000; owned, controlled and repaired by city; yearly rental, none. City can compel use of meters and any consumer may have one. CONSUMPTION.—(Galls.) av., 40,000,000; max., 60,000,000; min., 39,000,000. PRESSURE.— Ordinary and fire, 30 lbs. Steam fire engines are used. FINANCIAL.—Cost, $6,121,245. Bonded debt, $1,183,000: $634,000 at 7% due 1900-'05; $199,000 at 6% due 1906; $350,000 at 4% due '99-1925. Expenses, Operating, $107,000; int., $70,000. Revenue, Consumers, unmetered, $339,380; metered, $89,393. Fixed appropriation of $75,000 per yr. MANAGEMENT.—Prest., Albert L. Stephens; Civil Engr., G. S. Williams; Ch. Pump. Engr., Uriah Gould. Rept. by Secy. and Supt., L. N. Case, June 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, May 14, '81; new works, July 14, '77; natural gas as fuel, Mar. 19, '92; Allis pump, Apr. 20, '93; abolition of water rates, Jan. 25, '94.

35. **DOWAGIAC,** Cass Co. (2,806.) Built in '89 by city. SUPPLY.—11 artesian wells, pumping to reservoirs. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Holly hor. high-pressure. Wood used; av. cost, $1.10 per cord. RESERVOIRS.—Cap., 110,000 galls.; 80,000 and 30,000. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 11⅛ miles; cost extensions met by general tax. Taps, 600; made by city for $5. Services, iron; paid for by city. Meters, 16; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for manufacturers and public buildings. Hydrants, public, 79; private, 15. CONSUMPTION.—(Galls.) av., 300,000; max., 400,000; min., 200,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $75,000, at 5%, due in 20 yrs. Expenses: Operating, $2,900. Revenue: City, fire protection, $2,370; sewer flushing, $200; public buildings, $120; other pur-

poses, $500. Deficits are met by general tax. MANAGEMENT.—Prest., John Lindsly; Secy., A. M. Moon; Treas., R. Holmes; Supt., E. B. Jewell; Ch. Pump. Engr., O. Townsend. Rept. by Supt., July 11, '96. PROJECTED IMPROVEMENTS.—Additional wells. SEWERS.—Has sanitary and storm sewers.

36. **EAST TAWAS,** Iosco Co. (2,226.) Built in '87-8 by village. SUPPLY.—Lake Huron, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Holly hor. dup. DISTRIBUTION.—(In '88.) Mains, 5 miles. Taps, 220. Meters, 0. Hydrants,76. PRESSURE.—(In '89.) Ordinary, 30 lbs.; fire, 60 to 90 lbs. FINANCIAL.—(In '88.) Cost, $30,000. Bonded debt, $25,000, at 6%. Expenses, $3,500: Operating, $2,000; int., $1,500. Revenue, $2,500: Consumers, $1,000; City, $1,500. NOTE.—No rept. since '90-1 Manual.

37. **EDMORE,** Montcalm Co. (735.) Built in '81 by village. SUPPLY.—Three 4-in. driven wells, 60 ft. deep, pumping to reservoir and direct. PUMPS.—Cap., 720,000 galls.; 2—360,000 Dean single, direct acting. Wood used. RESERVOIR.—Cap., 100,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by village tax. Taps, 50; made by village, free. Services, iron; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 10,000; max., 8,000; min., 12,000. PRESSURE.—Ordinary, 8 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $10,000. No debt. Expenses: Operating, $500. Deficits are all paid by village. MANAGEMENT.—Prest., Chas. Brown; Secy., Wm. White; Treas., A. J. Burrett; Supt., Jas. S. Slemons; Ch. Pump. Engr., Henry Blair. Rept. by Supt., July 10, '96. SEWERS.—None. REFERENCE.—Eng. News, March. 29, '84.

38. **ELK RAPIDS,** Antrim Co. (1,240.) Built in '92 by Elk Rapids Water Supply Co.; put in operation Feb., '92. Engr. and Contr., M. Walker, Fenton. FRANCHISE.—25 yrs. from '92. Provides for optional purchase of works by city after 15 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $2,000 for public service. No legal difficulties. SUPPLY.—Elk Lake, pumping direct. PUMPS.—Cap., 1,500,000 galls.; M. Walker, water power. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 5 miles. Taps, 160; made by Co. for $6. Services, iron; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 46. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 45 lbs.; fire, 95-100 lbs. FINANCIAL.—Cost, $18,000. Expenses: Operating, $950; taxes, $350. Revenue: Consumers, $1,000; City, fire protection, $2,000; other purposes, $350. MANAGEMENT.—Prest., H. H. Noble; Secy. and Treas., H. B. Lewis. Rept. by Supt. and Ch. Pump. Engr., C. E. Wheeler, June 18, '96. SEWERS.—None.

39. **ESCANABA,** Delta Co. (6,808.) Built in '87 by Escanaba Water-Works Co. D. A. Brotherton, Cy. Engr., rept. Feb. 9, '97, that people voted on Feb. 6, '97, by 721 to 59, to issue bonds to buy present or build new works. FRANCHISE.—30 yrs. from '86: provides for optional purchase of works by city at end of 20 yrs. Rates are not subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Green Bay, pumping direct. Intake, 3,300 ft. long, ending in 45 ft. of water. PUMP.—Cap., 2,500,000 galls.; Worthington comp. cond. Penna. pea coal and anthracite screenings used; av. cost, $1.80 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 14 miles. Taps, 800; made by Co. for $12.65, including service to curb. Services, galv. i.; paid for by consumer. Meters: 185; owned by consumer and Co.; controlled and repaired by Co; yearly rental, $3.50 for ⅝-in. Use of meters compulsory for hotels, livery stables, R. Rs. and factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 129; private, 0. CONSUMPTION.—(Galls.) av., 500,000; max., 1,000,000; min., 400,000. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—(In '90.) Cost, $125,000. Bonded debt, $100,000, at 6%. MANAGEMENT.—Rept. by Supt., P. C. McGowen, June 5, '96. SEWERS.—Has sanitary and storm sewers.

40. **EVART,** Osceola Co. (1,269.) Built in '78-80 by village. Works are run in connection with electric light plant. SUPPLY.—Two 12 × 20 ft. wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 3—500,000 Walker direct acting. Beach and maple wood used; av. cost, $1.75 per cord. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Cost of extensions met by direct tax. Taps made by village for $2.50. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 300,000, in summer. PRESSURE.—Ordinary, 25 lbs.; fire, 70 to 80 lbs. FINANCIAL.—Cost, about $30,000. Bonded debt, $1,000, at 6%, due '96; $1,000, at 6%, due '97; $1,000, at 6%, due '98; total, $3,000. Expenses: Operating, $1,585; int., $180. Revenue: Consumers, unmetered, $1,248. Deficits of about $300 per yr. met by taxation. MANAGEMENT.—Prest. of village, G. W. Minchin; Clk., Irvin Chase; Supt., B. J. Davis. Rept. by Clk., Aug. 4, '96. SEWERS.—None. REFERENCE.—Eng. News, Oct. 13, '83.

—? **EWEN,** Ontonagon Co. (105.) Probably built by city since '90. Press rept. in '95 stated council would advertise for extension of works, including pumping machinery and station and mains. Jan. 1, '96, unsigned rept. stated "Frank Sparr is now in charge of works."

41. **FARWELL,** Clare Co. (584.) Built in '87-8 by village. SUPPLY.—Spring

brook, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Walker. DISTRIBUTION.—Mains, 2.5 miles. Taps, 40. Hydrants, 35. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $13,000, at 7%. Expenses, $1,050. Revenue, $200. NOTE.—No rept. since '90-1 Manual.

42. **FENTON**, Genesee Co. (Township, 3,667.) Built in '87 by village. SUPPLY.—Artesian wells, flowing into 20 × 20 ft. collecting reservoir, thence pumping direct. Pres. rept., May, '93, stated new reservoir was under construction. PUMPS.—Cap., 1,500,000 galls.; Walker. DISTRIBUTION.—Mains, 6 miles. Taps, 140. Hydrants, 65. PRESSURE.—(In '89.) Ordinary, 50 lbs.; fire, 80 to 125 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $25,000, at 5%. Expenses, $3,950: Operating, $1,700; int., $1,250. Revenue: Consumers, $700. NOTE.—No rept. since '90-1 Manual.

43. **FLINT**, Genesee Co. (9,803.) Built in '83 by Flint City Water-Works Co. FRANCHISE.—30 yrs. from '82; provides for purchase of works by city at end of that time or new franchise is to be granted. Rates to be reasonable and not to exceed the average rates of other towns and cities in Michigan similarly situated. Co. is not exempt from local taxes. City to pay $65 per hydrant per yr. for first 100 and $50 for each additional one. No legal difficulties. SUPPLY.—Flint River, pumping direct. PUMPS.—Cap., 7,000,000 galls.; 2—1,500,000 Holly-Gaskill hor. high duty and 4,000,000 Holly hor. dup. Ohio bituminous lump coal used; av. cost, $2.41 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 17½ miles; cost extensions met by revenue. Taps, 900; made by consumer. Services, galv. 1.; paid for by consumer. Meters: 825; owned, controlled and repaired by Co. Co can compel use of meters and any consumer may have one. Hydrants, public, 121; private, 6. CONSUMPTION.—(Galls.) av., 750,000; max., 1,000,000; min., 500,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $188,000. Cap. Stock: Authorized, $150,000. Bonded debt, $132,000, at 6%, due 1903. Expenses, $16,458: Operating, $7,355; int., $8,258; taxes, $845. Revenue, $18,969. Consumers, unmetered, $1,108; metered, $5,111; City, fire protection, $7,550; street sprinkling, $200; public buildings, $900; other purposes, $4,100. MANAGEMENT.—Prest., Wm. Hamilton; Secy., Fred J Catlin; Treas., Chas. S. Brown; Supt., Wm. L. Fisher; Ch. Pump. Engr., T. E. Rogers. Rept. by Secy., July 11, '96. SEWERS.—Has sanitary and storm sewers.

44. **FLUSHING**, Genesee Co. (965.) Built in '95 by village; put in operation Nov. 1. Engr., H. H. Humphrey, Detroit. Contr., T. C. Brooks, Jackson. SUPPLY.—13 wells, 50-150 ft. deep, pumping to reservoir and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon, dup. Bituminous coal used; av. cost, $2.60 per short ton. RESERVOIRS.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 6 miles; cost, extensions met by general tax. Taps, 50; made by Co. for $5. Services, iron; paid for by consumer. Meters, 2. Use of meters optional with consumer. Hydrants, public, 26. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Revenue: City, fire protection, $936. MANAGEMENT.—Prest., F. R. Ottaway; Secy. and Treas., Jas. B. French; Supt., Geo. L. Smith. Rept. by Clk., A. E. Ball, Aug. 1, '96. SEWERS.—None.

123. **FORT GRATIOT** (P. O. Port Huron), Saint Clair Co. (2,832.) Now part of the Port Huron water-works, which see.

45. **FRANKFORT**, Benzie Co. (1,175.) Built in '90 by Frankfort City Water Co.; put in operation Nov. 28. FRANCHISE.—5 yrs. from '90; provides for purchase of works by city. Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $1,800 per yr. for public service. Negotiations for purchase of works by city in progress. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Smith-Vaile. Wood and slabs used. TANK.—Cap., 95,184 galls.; 30 × 18 ft., wood, on brick and stone foundation on hilltop. DISTRIBUTION.—Mains, 3.8 miles. Taps, 99; made by Co. Meters, 0. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 75 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $20,000. Bonded debt (in '90), $20,000, at 7%. MANAGEMENT.—Secy. and Treas., Henry B. Smith, Bay City; Supt. and Ch. Pump. Engr., Jos. H. Wood. Rept. by Secy., Oct. 7, '96. SEWERS.—None.

46. **FREMONT**, Newaygo Co. (1,097.) Built in '83 by village. SUPPLY.—Driven wells, pumping direct. PUMPS.—Two Walker and one Wolverine; steam. (In '89 a 750,000 Walker pump was rept.) FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1⅛ miles; cost extensions met by bonds. Taps, 85; made by village for $1. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 12; private, 1. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $800, at 6%; due $500 in '96 and $300 in '97. Expenses, Operating, $500. Deficits are met by general tax. MANAGEMENT.—Prest., J. W. McNoble; Treas., J. A. Gerber. Rept. by Supt. and Ch. Pump. Engr., J. Gerber, June 4, '96. SEWERS.—None.

47. **GAYLORD**, Otsego Co. (661.) Built in '88 by village. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 18,000 galls.; deep well. TANK.—Cap., 85,000 galls.; 30 × 16 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 75. Hydrants, 18. FINANCIAL.—Cost, $8,500. Bonded debt, $8,500 at 6%. Expenses, $575: Operating, $65; int., $510. Revenue, $400. NOTE.—No rept. since '90-1 Manual.

48. **GLADSTONE,** Delta Co. (1,337.) Built in '89 by city. SUPPLY.—Little Bay de Noc, at head of Green Bay, pumping direct. PUMPS.—Cap., 1,250,000 galls.; Buffalo comp. dup. non-cond. Pine wood slabs used; av. cost, $1 per cord. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4 miles. Taps, 250; made by city for $7.50 to $8.50. Services, galv. i.; paid for by property owner. Meters: 4; owned by city and consumers. Use of meters compulsory for factories and hotels. Optional with consumer by paying for it, or free if his rent is more than $10 per yr. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. Steam fire engines are only used in case of accident to mains. FINANCIAL.—Cost, $40,000. Bonded debt (in '90), $35,000 at 6%, due in 1909. Expenses, Operating, $3,000. Revenue, Consumers, unmetered, $2,350; metered, $150. Deficits are met by general taxation. MANAGEMENT.—Comrs. Prest. and Supt., Jas. McWilliams; Secy., Chas. E. Mason; Ch. Pump. Engr., Fred. Filkins. Rept. by Supt., Aug. 15, '96. SEWERS.—None.

49. **GLADWIN,** Gladwin Co. (903.) Built in '88 by city. SUPPLY.—Artesian wells, pumping direct; river water used for fire protection. PUMPS.—Cap., 1,500,000 galls.; Gordon & Maxwell. DISTRIBUTION.—Mains (in '90), 1.3 miles. Taps (in '90), 34. Hydrants, 15. PRESSURE.—Ordinary, 18 lbs.; fire, 95 lbs. FINANCIAL.—Cost, $10,000. Bonded debt (in '90), $7,000 at 7%. Expenses (in '90), $1,439: Operating, $539; int., $900. MANAGEMENT.—Rept. by J. M. Shaffer, Dec. 12, '96. SEWERS.—None.

50, 51. **GRAND HAVEN,** Ottawa Co. (5,023.)

CITY PLANT.

Small works (including some 3,000 ft. of pipe) built in '88; continued in operation after Co. built works and extended in and since '88 to parallel Co.'s mains (see below). SUPPLY.—Forty driven wells, 25 ft. deep, and one open well, pumping direct. PUMPS.—Cap., 1,750,000 galls.; 750,000 Walker and 1,000,000 Worthington comp. high pressure. Brazil bituminous block coal used; av. cost, $2.40 per short ton. FISCAL YEAR CLOSED Mar. 28, '96. DISTRIBUTION.—Mains, 10 miles; cost extensions met by general fund. Taps, 350; made by city at $2 for ½-in., $2.25 for ⅝, $2.50 for ¾, and $4 for 1-in. Services, galv. i.; paid for by consumer. Meters: 8; owned, controlled and repaired by city; yearly rental, 10% of cost. Use of meters compulsory for R. R. tanks, livery barns and hotels. City can compel use of meters and any consumer may have one. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 300,000; max., 500,000; min., 200,000. PRESSURE.—Ordinary, 40 lbs.; fire, 110 lbs. Steam fire engines are only used where there are no mains. FINANCIAL.—Cost, $55,000. Bonded debt, $20,000: $16,000 at 5%; due $3,000 each in '99, 1900, 1901, 1902 and $4,000 in 1903. Expenses, Operating, $4,414. Revenue, Consumers, $3,220. Deficits are met by general taxation. MANAGEMENT.—Prest., Jno. Vaupell; Secy., Wm. N. Angel; Treas., Danl. Gale; Supt., R. Dykeman; Ch. Pump. Engr., Henry Smith. Rept. by A. M. Cosgrove, Supt. of Grand Haven Water-Works Co., Feb. 1, '97. SEWERS.—Has partial sanitary and storm sewers.

GRAND HAVEN WATER-WORKS CO.

Built in '84. FRANCHISE.—25 yrs. from '84; provides for purchase of works by city on expiration. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $4,200 for public service. LEGAL DIFFICULTIES.—There has been litigation with city since '87. City refused to pay hydrant rental, alleging non-compliance with franchise, but used hydrants for a number of yrs. Supreme Court has declared hydrant contract annulled, but ordered case back to lower courts to determine price city must pay for back hydrant rental. SUPPLY.—Open and driven wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Walker. Brazil and Hocking bituminous coal used; av. cost, $2.75 per short ton. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 7 miles. Taps, 260; made by Co. free. Services, galv. i.; paid for by Co. Meters: 6; owned, controlled and repaired by Co.; yearly rental, 10%. Use of meters optional with Co.; compulsory for hotel and livery stables. Hydrants, public, 60. CONSUMPTION.—(Galls.) av., 260,000; max., 400,000; min., 165,000. PRESSURE.—Ordinary, 30 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $70,000, at 6%. Expenses, Operating, $2,500; taxes, $375. Revenue, Consumers, unmetered, $2,200; metered, $150. MANAGEMENT.—Prest., C. H. Venner, Boston; Treas., Geo. Stickney; Supt., A. M. Cosgrove; Ch. Pump. Engr., H. G. Chatfield. Rept. by Supt., June 5, '96. REFERENCE.—Eng. News, Feb. 21, '85.

52. **GRAND LEDGE,** Eaton Co. (1,606.) Built in '96 by city; tested in Nov. Des. Engr., W. C. Titus, Grand Ledge. Contrs. (press rept.), Chase Construction Co., Detroit. SUPPLY.—Artesian wells, "will flow to reservoir." PUMPS.—Cap., 1,500,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). FINANCIAL.—Contract price, exclusive of wells, $24,300 (press rept.). MANAGEMENT.—Rept. by Cy. Clk., G. W. N. Irish, June 18, '96, and as noted above.

53. **GRAND MARAIS,** Alger Co. (Est., 317.) Built in '94 by town. SUPPLY.—Pumping direct. PUMPS.—Cap., 1,000,000 galls.; Worthington simple high pressure. DISTRIBUTION.—Mains, 2 miles. Taps, 60. Hydrants, 18. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $6,000. No debt. Expenses, Operating, $1,200. Rept. by Geo. Wilson, Jan. 18, '97. SEWERS.—None.

54, 55. **GRAND RAPIDS**, Kent Co. (60,278.)

GRAND RAPIDS HYDRAULIC CO.

Built in '40. SUPPLY.—Two receiving wells, 20 × 25 ft., and 20 ft. square × 20 ft. deep, supplied by springs, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; Blake dup. comp. cond., low- and high-pressure. STAND-PIPE.—Cap., 235,000 galls.; steel; 20 × 100 ft., about 250 ft. above river. DISTRIBUTION.—Mains, 20 miles. Taps, 1,000. Meters, 150. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 3,000,000. FINANCIAL.—Cost (in '89), $500,000. Bonded debt (in '89), $450,000 at 6%. Expenses, Operating, $12,000. MANAGEMENT.—Receiver, T. J. O'Brien. Rept. by Co., Dec., '96.

CITY WORKS.

Built in '73-5. SUPPLY.—Grand River, pumping to reservoir for low service and to stand-pipe for high service. In '90 three filter galleries, beneath river bed, were rept.: 14 × 16 ft.; 12 × 110 ft.; 40 (?) × 480 ft. PUMPS.—Cap., 31,000,000: 15,000,000 Nordberg triple exp.; 8,000,000 (makers rept. 13,000,000) Holly-Gaskill hor. high duty; two Butterworth & Lowe comp., 5,000,000 and 3,000,000. Linden coal used; av. cost, $3 per short ton. RESERVOIRS. — Cap., 6,000,000 galls.; flow-line 177 ft. above low water in river. STAND-PIPE. — Cap., 397,000 galls.; 30 × 75 ft.; iron. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 118 miles; cost extensions met by loans or income. Taps, 7,060; made by city for $2.50. Services, lead; paid for by consumer. Meters: 480; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 1,109. CONSUMPTION.—(Galls.) av., 10,916,286. PRESSURE.—Ordinary, 20 to 70 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,276,576. Bonded debt, $855,000; $150,000 at 5%, due in 1908; $300,000, at 4½%, due in 1912; $80,000, at 5%, due in 1909; $225,000, at 4½%, due in 1913; $100,000, at 4%, due in 1915. Expenses: Operating, $46,775; int., $39,125. Revenue: Consumers, $87,014; City, none. No deficits. MANAGEMENT.—Prest., C. G. Swensberg; Secy., Fred A. Twamley; Supt., John Van Amberg; Ch. Pump. Engr., E. A. Bates. Rept. by Secy., July 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 23, '81.

56. **GRAYLING**, Crawford Co. (Township, 1,558.) Built in '85 by Grayling, Hanson & Co. SUPPLY.—Au Sable River, by gravity. DISTRIBUTION.—Mains, 3.3 miles. Taps, 56. Hydrants, 12. FINANCIAL.—Cost, $3,000. No debt. Expenses, $175. Revenue, $1,460. SEWERS.—Has sewers. NOTE.—No rept. since '90-1 Manual.

57. **GREENVILLE**, Montcalm Co. (3,056.) Built in '88 by city. SUPPLY.—One large well, 25 × 35 ft. and 35 2-in driven wells, pumping direct. PUMPS.—Cap., 1,728,000 galls.; 2—864,000 Deane comp. dup. Hocking Valley bituminous coal used; av. cost, $2.76 per short ton. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by city. Taps, 327; made by city for $0.50. Services, lead; paid for by city to sidewalk. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 240,000; max., 484,000; min., 210,000. PRESSURE.—Ordinary, 80 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $55,185. Floating debt, $26,000, at 5%. Expenses: Operating, $2,368; int., $1,300. Revenue: Consumers, $2,348; City, fire protection, $2,080. MANAGEMENT.—Prest., L. W. Sprague; Secy., D. S. Seaman; Treas., E. Peck; Supt., Jas. Gracey; Ch. Pump. Engr., Wm. Maxted. Rept. by Supt., Sept. 14, '96. SEWERS.—Has one storm sewer only.

58. **GROSSE POINTE**, Wayne Co. (298.) Built in '90 by Grosse Pointe Constn. Co. Operated in connection with electric light plant. FRANCHISE.—25 yrs. from '90. Village to pay $10 per hydrant per yr. for sprinkling and fire purposes. SUPPLY.—Lake St. Clair, by gravity through two intakes to settling basin, thence pumping direct. PUMPS.—Cap., 4,500,000 galls.; two Walker, 1,500,000 and 3,000,000. Bituminous slack coal used; av. cost, $2.50 per short ton, delivered 9 miles from R. R. DISTRIBUTION.—Mains, 4 miles. Taps, 110. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 35 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $65,000. No debt. Revenue: City, fire protection, and street sprinkling, $270. MANAGEMENT.—Pres., Jos. H. Perry; Vice-Prest., W. C. McMillan; Secy. and Treas., T. H. Newberry; Supt., A. E. O'Harra. Rept. by Secy., Sept. 28, '96.

59. **HANCOCK**, Houghton Co. (1,772.) Built in '91-2 by village; put in operation in Mar. Engr., C. F. Loweth, St. Paul, Minn. Gravity domestic supply was introduced in '65 by village; supply was insufficient and no rentals were charged. In recent years fire protection was furnished to small extent by independent plant. SUPPLY.—Filter gallery near shore of Portage Lake, pumping to reservoirs. PUMP.—Cap., 1,250,000 galls.; Smith-Vaile comp. dup. Wood used. RESERVOIRS.—Cap., 400,000 galls.; 240,000 and 160,000. One reservoir is masonry and covered; each 200 ft. above city. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by water fund. Taps, 350; made by consumer for $10. Services, iron; paid for by city. Meters, 0. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $30,000. Expenses: Water is free to all in any quantity. MANAGEMENT.—Prest., Jacob Barr; Ch. Pump. Engr., Wm. Reutenbach. Rept. by Supt., A. J. Scott, June 8, '96. SEWERS.—Has sanitary and storm sewers.

60. **HARBOR SPRINGS**, Emmet Co. (1,052.) Bought by city in '95 at appraised valuation of $17,330; built in '90 by E. Shay (or Pray) & Son. (Press rept.).

61. **HARRISON,** Clare Co. (752.) Built in '85 by village. SUPPLY.—Budd Lake, pumping direct. PUMPS.—Cap., 750,000 galls.; two Walker. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 1.5 miles. Taps, 100. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 45,000. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $6,000. No debt. Expenses: Operating (in '90), $900. Revenue; Consumers (in '90), $825. MANAGEMENT.—City Clk., M. J. Follett; Supt., Wm. J. Holmes. Rept. by City Clk., Sept. 25, '96.

62. **HART,** Oceana Co. (757.) Built in '86 by village. Important extensions were made in '96 and electric light plant built to be operated in connection with water-works. Engrs., Humphrey & Carr, Detroit. SUPPLY.—River, pumping direct. Press rept. states supply was changed to artesian wells in '96. PUMPS.—Cap., 2,500,000 galls.: two Walker, aggregating 1,000,000; 1,500,000 Laidlaw-Dunn-Gordon (rept. by makers as added in '96.) DISTRIBUTION.—Mains, about 4 miles (press rept. in '96). Taps, 50. Hydrants, 5. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $4,500. Debt, $1,500, at 8%. Expenses, $175. Revenue, $122. NOTE.—No official rept. since '90-1 Manual.

63. **HASTINGS,** Barry Co. (2,972.) Built in '86-7 by village. SUPPLY.—Well, 20 × 30 ft., pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane dup. high pressure. DISTRIBUTION.—(In '88.) Mains, 4 miles. Taps, 200. Meters, 0. Hydrants, 40. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 80 to 100 lbs. FINANCIAL.—(In '88.) Cost, $30,000. Bonded debt, $25,000, at 4½%. Expenses, $3,125: Operating, $2,000; int., $1,125. Revenue: Consumers, $1,500. NOTE.—No rept. since '90-1 Manual.

—? **HIGHLAND PARK,** Wayne Co. (Est., 257.) June 8, '96, E. Ketcham, Clk., rept. that bids had been asked for $23,000 of bonds to meet the cost of distribution system. Dec. 13, '96, press rept. stated Detroit W. Bd. had just contracted to lay 26,445 ft. of 16 to 6-in. mains, work to begin at once, village to pay $20,337. Earlier press rept. stated water would be bought from Detroit at 3 cts. per 1,000 cu. ft., or about 4 cts. per 1,000 galls.

64. **HILLSDALE,** Hillsdale Co. (3,915.) Built in '85-86 by village. SUPPLY.—Bawbesee Lake, pumping direct. PUMPS.—Cap., 3,000,000 galls.; Blake. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 15 miles. Taps, 815. Meters, 5. Hydrants, public, 78. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 85 to 130 lbs. FINANCIAL.—Cost, $70,000. Bonded debt, $30,000. Expenses, $4,550: Operating, $3,200; int., $1,350. Revenue: Consumers, unmetered, $5,700. MANAGEMENT.—Bd. of Pub. Wks. Prest., C. F. Cook. Rept. by Cy. Clk., Geo. A. James, Sept. 24, '96. SEWERS.—Has sewers.

65. **HOLLAND,** Ottawa Co. (3,945.) Built in '83 by city. SUPPLY.—Driven wells, pumping direct from collecting reservoir. PUMPS.—Cap., 3,000,000 galls.; two Walker direct acting; 1,500,000 Nordberg comp. cond. FISCAL YEAR CLOSED Mar. 16. DISTRIBUTION.—Mains, 10¾ miles. Taps, 410. Meters, 24. Hydrants, public, 81. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—(In '89.) Ordinary, 38 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $55,719. Bonded debt, $44,000, at 5%. Expenses: Operating, $3,058; int., $2,200. Revenue: Consumers, $2,669. MANAGEMENT.—Bd. of Pub. Wks. Prest., C. J. De Roo. Rept. by Secy., G. Van Schelven, Oct. 6, '96.

66. **HOLLY,** Oakland Co. (1,266.) Built in '79 by city. SUPPLY.—Wells, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—750,000 Walker, others not given. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 5 miles. Taps, 200. Hydrants, public, 30. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost (in '83), $10,099. Expenses, $1,500. Revenue, $1,700. MANAGEMENT.—Com. of two. Supt., A. J. Colgrove. Rept. by Vill. Clk., Fenton S. Beebe, Sept. 22, '96. REFERENCE.—Eng. News, Apr. 28, '83

67. **HOUGHTON,** Houghton Co. (2,062.) Built in or prior to '93 and now owned by city. SUPPLY.—Pumping to tanks. Bids for second tank were invited early in '94. NOTE.—Information from press repts. in '93-4.

68. **HOWARD CITY,** Montcalm Co. (1,137.) Built in '90 by village. SUPPL — River, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Walker. Wood used; av. cost, $1.15 per day. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by tax. Taps, about 200; made by city, free. Services, lead and iron; paid for by city to curb. Meters, 0. Use of meters optional with consumer. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 80,000; max., 110,000; min., 60,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 120 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $10,500: $8,000, at 6%, due $1,000 each yr. from 1900; $2,500, at 7%, due $500 each year until paid. Expenses: Operating, $1,245. Revenue, $1,270: Sewer flushing, $10; other purposes, $1,260. MANAGEMENT.—Prest. of Water Comrs., Jas. Totton; Secy., Warren Lisk; Treas., S. C. Scott. Rept. by Supt. and Ch. Pump. Engr., C. C. Messenger, June 5, '96 SEWERS.—Has partial system of sanitary sewers.

69. **HOWELL,** Livingston Co. (2,387.) Built in '94 by village; put in operation Sept. Contr., M. Walker. SUPPLY.—Ten 6-in. wells about 60 ft. deep, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Walker. Mills Creek coal used; av. cost, $2.35 per short ton. FISCAL YEAR CLOSED Aug. 1. DISTRIBUTION.—Mains, 11 miles. Taps, 270: made by consumer for $5.75. Services, iron; paid for by consumer. Use of meters op-

tional with consumer. Hydrants, public, 62. CONSUMPTION.—(Galls.) av., 250,000; max., 400,000; min., 150,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $41,000. Debt, $39,000, at 5%. Expenses: Operating, $2,300. Revenue, $2,100. Deficits are met by village tax. MANAGEMENT.—Prest., Dr. Rob Bell; Secy. and Supt., Geo. P. Dudley; Ch. Pump. Engr., Chas. N. Wilcox. Rept. by Secy., Aug. 8, '96. SEWERS.—Has storm sewers only.

70. **HUDSON,** Lenawee Co. (2,178.) Built in '90 by village. SUPPLY.—Eight 6-in. wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Hughes comp. cond. FISCAL YEAR CLOSED Mar. 16. DISTRIBUTION.—Mains, 9 miles; cost extensions met by bonds. Taps, 428; made by city at $5 for ⅝-in. tap. Services, iron; paid for by property owner. Meters: 4; owned, controlled and repaired by city. Use of meters optional with city; compulsory for motors, greenhouses and creamery. Hydrants, public, 61. CONSUMPTION.—(Galls.) av., 300,875. PRESSURE.—Ordinary, 45 to 50 lbs.; fire, 80 to 90 lbs. FINANCIAL.—Cost, $38,000. Bonded debt, $36,000. Expenses, Operating, $3,643. Revenue, Consumers, $3,118; permits, $373. MANAGEMENT.—Prest., N. Lane; Secy. and Supt., A. P. Fellows; Treas., M. P. Swaney; Ch. Pump. Engr., G. R. Mills. Rept. by Supt., July 20, '96. SEWERS.—Has partial system of sanitary sewers.

71. **IMLAY CITY,** Lapeer Co. (1,251.) Built in '90-1 by city; put in operation Jan. 24. SUPPLY.—Three deep wells flowing into reservoir, thence pumping to tank. PUMPS.—Cap., 1,000,000 galls.; two Deane dup. RESERVOIR.—Cap., 40,000 galls. TANK.—Cap., 30,000 galls.; on tower. DISTRIBUTION.—Mains, 3 miles. Meters, 0. Hydrants, public, 35. FINANCIAL.—Cost, $19,000. MANAGEMENT.—Three Water Comrs. Rept. by Mayor, Jas. M. Sheppard, Sept. 24, '96.

72. **IONIA,** Ionia Co. (4,482.) Built in '76 by village. SUPPLY.—Springs and artesian wells, pumping (direct?). PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Smith-Vaile. Ocean mine gas coal used; av. cost, $3.20 per short ton. RESERVOIR.—Cap., 50,000 galls. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 16 miles; cost extensions met by tax or general fund. Taps, 806; made by city with wood service for $3; iron service, $4. Services, galv. i. and lead; paid for by consumer. Meters, 0: Use of meters optional with city and will be introduced later. Hydrants, public, 111. CONSUMPTION.—(Galls.) av., 400,000; max., 900,000; min., 350,000. PRESSURE.—Ordinary and fire, 55 lbs. FINANCIAL.—Cost, $112,225. Bonded debt, $30,000, at 5%; due 1908; $9,600, at 7%, due any time. Expenses: Operating, $6,891; int., $2,190. Revenue, Consumers, $5,250; street sprinkling, $60; public buildings, $150. Deficits are met by general fund. MANAGEMENT.—Prest., M. Vizard; Supt., Frank C. Sibley; Ch. Pump. Engr., Thos. Willsie. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Feb. 18, '82.

73. **IRON MOUNTAIN,** Dickinson Co. (8,599.) Built in '90 by Iron Mountain Water-Works Co.; put in operation Dec. 1. FRANCHISE.—30 yrs. from '90. Rates are subject to regulation by city. Co. is exempt from local taxes for 5 yrs. City to pay $9,000 per yr. for 156 hydrants; $50 for each additional. No legal difficulties. SUPPLY.—20 6-in. artesian wells, pumping to reservoir and elevated tank. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Gordon dup. comp. Pittsburg lump coal used; av. cost, $3.20 per short ton. RESERVOIR.—Cap., 680,000 galls.; storage. TANK.—Cap., 500,000 galls.; 60 × 26 ft., steel, inclosed in masonry tower. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 17 miles; cost extensions met by bonds. Taps, 600; made by Co. at $5 for ½-in. Services, galv. i.; paid for by consumer. Meters, 112; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one by paying for it. Hydrants, public, 172; private, 2. CONSUMPTION.—(Galls.) av., 390,000. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost (in '90), $150,000. Cap. Stock (in '90), $100,000. Bonded debt (in '90), $100,000. Revenue, City, fire protection, $10,000. MANAGEMENT.—Prest., Wm. Hay, Ypsilanti. Rept. by Supt., E. A. Croce, June 8, '96. SEWERS.—Has sanitary and storm sewers.

74. **IRONWOOD,** Gogebic Co. (7,745.) Construction was begun in '87 by Gogebic Gas & Water Supply Co. and completed in Mar., '91, by Ironwood Water Co. In '94, court decided proposed purchase of works by Co. would be illegal, as it would cause debt above limit. FRANCHISE.—30 yrs. from '91; provides for purchase of works by city after 10 yrs. Co. is exempt from local taxes. City to pay $14,000 for public service. No legal difficulties. SUPPLY.—Montreal River, pumping to stand-pipe. PUMPS.—Cap., 4,000,000 galls.; Deane: two comp. dup. and one dup. Hard maple wood used; av. cost, $2.25 per cord. FILTERS.—Cap., 1,000,000 galls.; Jewell. RESERVOIR.—Cap., 500,000 galls.; distributing. TANKS.—Cap., 800,000 galls.; two 400,000 each. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 14 miles; cost extensions met by additional hydrants, for which city pays. Taps, 750; made by consumer. Services, lead; paid for by consumer. Meters: 20; owned, controlled and repaired by consumer; yearly rental, none. Use of meters optional with Co.; compulsory for R. R., mines and certain private consumers. Hydrants, public, 145. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 93 lbs.; fire, 160 lbs. FINANCIAL.—Cap. Stock: Authorized, $200,000. Bonded debt, $226,000, at 6%; due 1920. MANAGEMENT.—Prest. and Genl. Mgr., J. S. Kennedy; Secy. and Treas., E. T. Hosford, Burlington, Ia. Rept. by Genl. Mgr., June 8, '96. SEWERS.—Has sanitary and storm sewers.

75. **ISHPEMING,** Marquette Co. (11,197.) Built in '82 by city. SUPPLY.—Lake Sally, by gravity, with direct pumping for fire protection. PUMPS.—Cap., 5,000,000 galls.; three: 750,000, 1,250,000 and 3,000,000 Worthington; latter is a comp. non-cond. Pumping done by contract with Lake Superior Iron Co. at cost of $600 per yr. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 25 miles; cost extensions met by water fund. Taps, 1,318; made by city, including service to curb, for $12. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 121. CONSUMPTION.—(Galls.) av., 900,000 est. PRESSURE.—Ordinary, 48 lbs.; fire, 85 lbs. Steam fire engines are used. FINANCIAL.—Expenses, Operating, $4,124. MANAGEMENT.—Comrs. Prest., C. H. Hall. Rept. by Supt., P. H. Devine, June 8, '96. SEWERS.—Has sanitary and storm sewers.

76. **ITHACA,** Gratiot Co. (1,627.) Built in '84 by village for fire protection, but extended since (probably about '90) for general supply. SUPPLY.—Deep well or wells, pumping to stand-pipe. A 35 × 20 ft. reservoir was projected in '95. STAND-PIPE.—Cap., 150,000 galls.; 20 × 60 ft. DISTRIBUTION.—Taps, about 175. NOTE.—Last official rept. (in '88) supplemented by press repts. REFERENCE.—Eng. News, Mar. 21, '85.

77. **JACKSON,** Jackson Co. (20,798.) Bought by city in '71; built in '70 by Co. SUPPLY.—Four artesian wells, pumping direct. Pump-well, 25 × 25 ft. PUMPS.—Cap., 12,000,000 galls.; 4,000,000 and 8,000,000 Holly-Gaskill hor. high duty. Press repts. state Bacon air lift plant was added in '96. Jackson (Mich.) slack used; av. cost, $1.70 per short ton. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 38½ miles; cost extensions met by appropriations from general fund. Taps, 2,455; made by city for $2 for ½-in., $3 for ⅝-in. and $3.50 for ¾-in. Services, lead; paid for by consumer. Meters: 107; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city; compulsory for tenement blocks, shops, etc. Hydrants, public, 368; private, 6. CONSUMPTION.—(Galls.) av., 2,400,000; max., 4,000,000; min., 1,700,000. PRESSURE.—Ordinary and fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $220,000: $50,000, at 8%; due $10,000 annually, '96 to 1900; $30,000, at 5%, due 1901 to '03; $50,000, at 5%, due 1904; $70,000, at 5%, due 1908 to '11, inclusive; $20,000, at 5%, due 1912. Expenses, Operating, $10,100. MANAGEMENT.—Prest., James Frank; Supt., J. K. Bogers; Ch. Pump. Engr., C. H. Christopher. Rept. by Supt., Oct. 22, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 3, '81.

78. **KALAMAZOO,** Kalamazoo Co. (17,853.) Built in '69 by city. SUPPLY.—Two large surface wells, one 24 × 40 ft., and six artesian wells, pumping direct. PUMPS.—Cap., 8,000,000 galls.; 2—3,000,000 Holly vert. high duty and 2,000,000 Worthington non-comp. non-cond. Hocking Valley coal used; av. cost, $2.70 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 40 miles; cost extensions met by city tax. Taps, 2,700; made by consumer. Services, iron; paid for by consumer. Meters: 350; owned, controlled and repaired by city. Hydrants, public, 364. CONSUMPTION.—(Galls.) av., 1,800,000. PRESSURE.—Ordinary, 45 lbs.; fire, 90 lbs. One steam fire engine is used. FINANCIAL.—Cost, $635,000. Expenses, Operating, $10,000. Revenue (in '90), $14,092. MANAGEMENT.—Mayor, Jas. Monroe; Clk., C. H. Gleason; Treas., L. Hollander. Rept. by Supt., W. F. Reed, Nov. 9, '96. REFERENCE.—Eng. News, Aug. 6, '81.

79. **KALKASKA,** Kalkaska Co. (1,161.) Built in '90-1 by village. SUPPLY.—River, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Walker. DISTRIBUTION.—Mains, 3.5 miles; wood. Services, galv. i. Hydrants, 36. PRESSURE.—Ordinary, 30 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $25,000 at 6%. NOTE.—No rept. since '90-1 Manual.

80. **LAKE ANN,** Benzie Co. (Est., 500.) Built in '95 by city; put in operation Nov. 1. No Engrs. nor Contrs. SUPPLY.—Driven wells, ¾ mile from village, pumping to stand-pipe and direct. PUMP.—Walker, water power. TANK.—Cap., 88,000 galls.; 16 × 16 × 20 ft., on hill. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by general taxes and sinking and water funds. Taps, 50; made for $5. Services, ¾-in. iron; paid for by house owner. Meters, 0. Hydrants, public, 10; private, 5. PRESSURE.—Ordinary, 32 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $5,000. Debt, $5,500: Floating, $1,500; Bonded, $4,000, at 7%; due 10 yrs. Sinking Fund, $280. Expenses: Operating, $200. Deficits are met entirely by taxation. MANAGEMENT.—Prest., N. E. Degen; Clk., M. G. Paul; Treas., Byron Tower; Supt., G. E. Coleman; Ch. Pump. Engr., W Whooper. Rept. by Clk., June 16, '96. SEWERS.—None.

81 **LAKE CITY,** Missaukee Co. (668.) Built in '88 by D. Reeder & Co. FRANCHISE.—Provided for purchase of works by city in '94, price to be determined by arbitration. Rates not subject to regulation by city. SUPPLY.—Muskrat Lake, pumping direct. PUMP.—Cap., 1,000,000 galls.; Davidson. DISTRIBUTION.—Mains, 1 mile. Taps, 65. Hydrants, 7. PRESSURE.—Ordinary, 30 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $8,053. No debt. Expenses, $620. Revenue, $1,600. MANAGEMENT.—Owner, Dan'l Reeder. NOTE.—No rept. since '90-1 Manual.

82. **LAKE LINDEN,** Houghton Co. (Est., 3,500.) Built in '87 by village. SUPPLY.—Artesian well and creek, pumping direct from former for domestic use, by gravity from latter for fire protection. PUMPS.—Cap., 35,000 galls.; from Gray Bros. RESERVOIR.—(In '89.) 60 × 80 ft., × 16 ft. deep. DISTRIBUTION.—Mains, 4 miles. Taps,

278. Hydrants, 36. FINANCIAL.—Cost (in '87), $40,000. Bonded debt (in '87), $10,000, at 6%. Press rept., Jan., '97, stated there were $25,000 bonds then outstanding. Expenses, $200. Revenue, $1,500. NOTE.—No rept. since '90-1 Manual.

83. L'ANSE, Baraga Co. (655.) Built in '93 by village; put in operation Apr. 1. Engr., James P. Edwards, Houghton. Contr., Ed. S. Sykes, Minneapolis, Minn. SUPPLY.—Spring fed creek, by gravity; fall of 230 ft. in 1½ miles. RESERVOIR.—Cap., 1,000,000 galls.; impounding. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 7,700 ft. (supply main?); cost extensions met by general fund. Taps, 70; made by village for $7. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 22. PRESSURE.—Ordinary, 80 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $13,500, at 7%; due $1,000 per annum. Sinking Fund, none. Expenses, Operating, $75. Revenue, Consumers, $900. Deficits and expenses met by liquor licenses and water rents. MANAGEMENT.—Prest., Jno. Campbell; Secy., Martin Votsch; Treas., Roger C. Williams. Rept. by Chn., Aug. 1, '96. SEWERS.—None.

84. LANSING, Ingham Co. (13,102.) Built in '86 by city. SUPPLY.—Wells (8 tile-lined, in '90), pumping to stand-pipe. PUMPS.—Cap., 8,000,000 galls.: 5,000,000 Holly-Gaskill hor. high duty; 2—1,500,000 Worthington comp. cond. Hocking run of mine coal used; av. cost, $2.50 per short ton delivered in bin. STAND-PIPE.—Cap., 300,000 galls.; steel, 18 × 152 ft. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 40½ miles; cost extensions met by earnings. Taps, 2,547; made by city, free. Services, lead to curb; paid for by city to curb. Meters: 325; owned, controlled and repaired by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 289; private, 4. CONSUMPTION.—(Galls.) av., 1,500,000; max., 2,000,000; min., 1,000,000. PRESSURE.—Ordinary, 65 lbs.; fire, 85 lbs. FINANCIAL.—Debt, $137,000: Floating, $12,000, at 4%; Bonded, $75,000, at 4½%, due 1905, '10 and '15, in equal payments; $50,000, at 4%, due 1900 and 1920, half at each date. Expenses, Operating, $8,824; int., $6,060. Revenue, $33,161: Consumers, unmetered, $14,367; metered, $3,865; City, fire protection, $10,000; public buildings, $828; other purposes, $4,101. No deficits. MANAGEMENT.—Prest., Horace Lapham; Secy., Danl. Barringer; Treas., City Treas.; Supt., E. A. Edgerton. Rept. by Secy., Sept. 25, '96. SEWERS.—Has sanitary and storm sewers.

85. LAPEER, Lapeer Co. (2,753.) Built in '88 by village. SUPPLY.—Three flowing artesian wells, pumping direct. Wells overflow in collecting reservoir. PUMPS.—Cap., 1,750,000 galls.; two Walker. RESERVOIR.—Cap., 30,000 galls. DISTRIBUTION.—Mains, 11 miles. Taps, 275. Hydrants, 70. PRESSURE.—(In '89.) Ordinary, 38 lbs.; fire, 95 to 100 lbs. FINANCIAL.—Cost, $43,000. Bonded debt, $40,000, at 5%. Expenses, $4,500: Operating, $2,000; int., $2,500. Revenue, Consumers, $2,800. NOTE.—No rept. since '90-1 Manual.

——? LEWISTON, Montmorency Co. (Not given.) Albert Township voted $3,500 in bonds for works in '95 and let contracts for about 5,000 ft. of pipe-laying, work to be completed by Oct. 1, '95. Supply was to be pumped from lake. Supervisor, M. J. McCormick. Rept. by Clk., J. H. Pinkerton, July and Aug., '95. Not known whether work was done.

86. LOWELL, Kent Co. (1,829.) Built in '87 by Lowell Water Co. Press rept., Jan. 5, '97, stated Lowell Water & Light Co. had just filed amended incorporation articles. SUPPLY.—20 driven wells, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Smith & Valle dup. high-pressure. RESERVOIR.—(In '89.) 34 × 8 ft. DISTRIBUTION.—(In '87.) Mains, 3.6 miles. Hydrants, 50. PRESSURE.—(In '89.) 65 lbs. FINANCIAL.—(In '87.) Cost, $22,000. Cap. Stock, $33,000. NOTE.—No rept. since '90-1 Manual.

87. LUDINGTON, Mason Co. (7,517.) Built in '82 by Ludington Water Co. FRANCHISE.—30 yrs. from '92; provides for purchase of works by city at appraised value. Rates are fixed in contract and subject to regulation by city. Co. is not exempt from local taxes. City to pay $40 per hydrant per yr. No legal difficulties. SUPPLY.—Lake Michigan, pumping direct. PUMPS.—Cap., 5,000,000 galls.: 2,000,000 Holly-Gaskill hor. high-duty; 3,000,000 Holly hor. dup. Wood used; av. cost, $1.25 per cord. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 17 miles. Taps, 750; made by Co. at $1.78 for ½-in. tap and lead connection. Services, galv. i.; paid for by consumer. Meters: 14; owned, controlled and repaired by Co. Use of meters compulsory for factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 150; private, 10. CONSUMPTION.—(Galls.) av., 980,655. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost, $141,900. Cap Stock: Authorized, $80,000; all paid-up; paid no div'd in '95. Bonded debt, $78,000, at 6%, due 1912. Expenses, $11,402: Operating, $6,091; int., $4,701; taxes, $610. Revenue, $15,779: Consumers, unmetered, $9,537; City, fire protection, $6,242. MANAGEMENT.—Prest., O. G. Wing; Secy. and Supt., H. L. Williams; Treas., Geo. N. Stray; Ch. Pump. Engr., J. H. Newton. Rept. by Co., June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 20, '83.

F 4. LYONS, Ionia Co. (612.) Built in '79 by village for fire protection and street sprinkling. Supply, river, pumping direct with 864,000-gall. Holly pump. Hydrants, 7. Cost, $10,000. General tax on all property in corporate limits. Prest., S. W. Webber; Secy. and Supt., L. H. Hale; Treas., H. A. Ranger. Rept. by Supt., July 14. Reference, Eng. News, Jan. 26, '84.

88. **MANCELONA,** Antrim Co. (1,205.) Built in '94 by village. SUPPLY.—12 artesian wells, pumping direct. PUMPS.—Cap., 500,000 galls.; 2—250,000 Blake dup. Wood used. DISTRIBUTION.—Mains, 3¼ miles. Taps, 200; made for $5. Hydrants, public, 30. PRESSURE.—Fire, 100 lbs. FINANCIAL.—Cost, about $16,000. Bonded debt, about $15,000. Floating debt, $1,400, at 5½%. Expenses, Operating, $1,000. MANAGEMENT.—Prest., L. E. Slussar. Rept. by F. A. Street, Vill. Clk., June 25, '96. SEWERS.—None.

89. **MANISTEE,** Manistee Co. (12,812.) Built in '82-3 by Manistee Water Co. FRANCHISE.—30 yrs. from '82; provides for optional purchase of works by city at any time at cost and 10% premium. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $10,000 for hydrant rental; contract for 20 yrs from '83. No legal difficulties. SUPPLY.—River and two large wells, pumping direct. In '89, 30 × 30-ft. well was reported with 50 2 and 4-in. driven wells in bottom, about half 45, remainder 100 ft. deep. PUMPS.—Cap., 6,750,000 (?) galls.: 4,000,000 Holly Gaskill hor. high duty; 750,000 Holly hor. dup.; 2,000,000 Holly quadruplex. Last two not mentioned in rept., but were in use in '89, before adding large pump. Beach wood used; av. cost, $2.35, and pine slabs at $1.60 per cord, delivered. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 14 miles; cost extensions met by receipts from meter and hydrant rentals. Taps, 1,100; made by Co. for $3. Services, galv. i.; paid for by consumer. Meters, 102; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 102; private 5. CONSUMPTION.—(Galls.) av., 750,000; max., 1,100,000; min., 525,000. PRESSURE.—Ordinary, 62 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $193,875. Cap. Stock, $200,000. Bonded debt, $50,000. Expenses, $11,403: Operating, $7,862; int., $2,907; taxes, $635. Revenue, $23,834: Consumers, unmetered, $13,345; metered, $737; City, fire protection, $9,611; street sprinkling, $125; fines, $16. MANAGEMENT.—Prest., Jas. Dempsey; Secy., T. J. Ramsdell; Treas., R. R. Blacker; Supt., S. A. Cahill; Ch. Pump. Engr., Fredk. Lanks. Rept. by E. Ramsdell, July 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 8, '83.

D 1. **MANTON,** Wexford Co. (661.) Built in '94 by city for domestic use; put in operation Sept. 10. Engr. and Contr., M. Walker. Supply, Cedar Creek, pumping direct. Pump, cap., 700,000 galls.; Walker. Wood used; av. cost, $1.50 per cord. Mains, 2¾ miles. Taps, 80. Services, iron and lead; paid for by consumer. Meters, 0. Use of meters optional with consumer. Pressure, 50 to 100 lbs. Financial, Cost, $11,000. Bonded debt, $10,000, at 7%. Expenses: Operating, $600. Management, Prest., Geo. F. Williams; Secy., H. C. Bostic. Rept. by F. P. Allen, Supt. 11, '96. Sewers, none.

90. **MARCELLUS,** Cass Co. (830.) Built in '94 by city; put in operation in Sept. Engr., W. S. Parker, Pontiac. Contrs., Mann & Andrews, Dowagiac. SUPPLY.—Driven wells, pumping direct. PUMP.—Cap., 850,000 galls.; Deane. DISTRIBUTION.—Mains, 3¾ miles. Taps, 100; made by city for $1.75. Services, iron; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $8,000, at 6%, due in 8 yrs. MANAGEMENT.—Prest., H. C. Lambert; Secy., G. R. Clemens; Treas., C. H. Hudson. Rept. by Prest., June 20, '96.

91. **MARINE CITY,** Saint Clair Co. (3,268.) Built in '84 by town. SUPPLY.—St. Clair River, pumping direct. PUMPS.—Cap., 2,500,000 galls.; 2—750,000 Walker; other not given. DISTRIBUTION.—Mains, 9 miles. Taps, 500. Hydrants, 96. CONSUMPTION.—(Galls.) av., 110,584. PRESSURE.—(In '89.) Ordinary, 25 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $42,000. Bonded debt, $32,000, at 6%. Expenses: $3,812: Operating, $1,892; int., $1,920. Revenue, $3,324. NOTE.—No rept. since '90-1 Manual.

92. **MARLETTE,** Sanilac Co. (Est., 853.) Built in '96 by village; put in operation May 1. Engr., W. R. Coats, Grand Rapids. Contr., T. C. Brooks, Jackson. SUPPLY.—2 deep wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Laidlaw-Dunn-Gordon. RESERVOIR.—Cap., 148,000 galls.; collecting, 30 × 28 ft. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by tax. Taps, 20; made by consumer for $5. Services, iron; paid for by consumer. Meters, 3; owned by consumer; controlled by village. Use of meters compulsory for mills and all places where computation of consumption is difficult. Village can compel use of meters and any consumer may have one. Hydrants, public, 25. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $14,000, at 5%, due 20 yrs. from 1895. Expenses: Operating, $1,400. Revenue, $220: Consumers, unmetered, $150; metered, $30; street sprinkling, $40. MANAGEMENT.—Prest., O. M. Barnes; Secy., D. E. Hubbell; Treas., C. L. Messer; Supt., Jas. Hoskins. Rept. by D. E. Hubbell, June 22, '96. SEWERS.—Has storm sewers only.

93. **MARQUETTE,** Marquette Co. (9,093.) Built in '70 by city. SUPPLY.—Lake Superior, pumping direct. PUMPS.—Cap., 6,000,000 galls.: 3,000,000 Worthington comp. cond.; 3,000,000 Gaskill hor. high duty. Pine slabs used; av. cost, $1.40 per cord. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 18 miles; cost extensions met by general taxation. Taps, 1,400; made by city at $7 for ½-in., $12 for ¾-in., including service to curb. Services, galv. i.; paid for by property owner. Meters: 2; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with consumer; compulsory for livery stables and elevators. Hydrants, public, 170. CON-

SUMPTION.—(Galls.) av., 2,000,000; max., 3,500,000; min., 1,200,000. PRESSURE.—Ordinary, 90 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $301,383. Bonded debt, $89,000, at 5%: $15,000 due '98; $14,000 due 1900; $60,000 due 1901. Expenses: Operating, $10,000; int., $4,450. Revenue from consumers pays for fire dept., int. on bonds and part of principal. MANAGEMENT.—Prest. and Treas., J. M. Wilkinson; Secy. and Supt., John P. Kern; Ch. Pump. Engr., J. C. Casford. Rept. by Supt., May 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Sept. 1, '83.

94. **MARSHALL,** Calhoun Co. (3,968.) Built in '89 by Marshall Water-Works Co. Press repts. in '94 stated city had voted $50,000 of bonds for works. SUPPLY.—Well, pumping to stand-pipe. PUMPS.—Cap., 2,000,000.; 2—1,000,000 Worthington comp. high pressure. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft. DISTRIBUTION.—(In '89.) Mains, 8 miles. Taps, 50. Hydrants, 85. FINANCIAL.—(In '89.) Cost, $100,000. Bonded debt, $80,000, at 6%. Revenue: City, $4,000. NOTE.—No rept. since '90-1 Manual.

95. **MASON,** Ingham Co. (1,875.) Built in '91 by city; put in operation Jan. 1, '92. Engr., W. C. Parker. Contrs., Lansing Iron & Engine Wks. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.: 2—1,000,000 Hughes. Av. cost of coal used, $2.75 per short ton. STAND-PIPE.—Cap., 136,556 galls.; iron. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 6 miles. Taps, 212; made by city for $8. Services, lead; paid for by consumer. Meters: 1; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for R. R. Co. Hydrants, public, 58; private, 1. CONSUMPTION.—(Galls.) av., 71,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $35,000. Expenses, Operating, $1,470; int., $1,750. MANAGEMENT.—Prest., John Dunsback; Secy., C. L. Casterlin; Supt. and Ch. Pump. Engr., H. E. Coburn. SEWERS.—Has storm sewers only.

96. **MENOMINEE,** Menominee Co. (10,630.) Built in '84 by Menominee Water Co. FRANCHISE.—25 yrs. from '90; provides for purchase of works by city in 1905, price to be settled by agreement or arbitration. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay for hydrant rental; $50 each. SUPPLY.—Green Bay, pumping direct. PUMPS.—Cap., 6,000,000 galls.; Deane dup. comp. cond.: 1—3,000,000 and 2—1,500,000. Wood used. FISCAL YEAR CLOSED Mar. 1, DISTRIBUTION.—Mains, 25 miles. Taps made by Co. for $2.50. Meters: 25; owned by consumer. Hydrants, public, 276; private, 20. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000; all paid-up. Paid no div'd in '96. Bonded debt, $250,000. Revenue: City, fire protection, $13,800. MANAGEMENT.—Prest., Wm. A. Lynch, Canton, O.; Mgr., H. F. Dunham, N. Y. city. Rept. by Prest., Dec. 30, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 10, '86.

97. **MIDLAND,** Midland Co. (2,277.) Built in '82 by city. SUPPLY.—Chippewa River, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Walker. (Makers rept. 1,000,000 Laidlaw-Dunn-Gordon added in '90.) DISTRIBUTION.—(In '88.) Mains, 4.6 miles. Taps, 150. Meters, 0. Hydrants, 32. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—(In '88.) Cost, $22,000. Bonded debt, $20,000 at 5%. Expenses, $3,600: Operating, $2,600; int., $1,000. Revenue, $2,770: Consumers, unmetered, $2,637; City, $133. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, June 16, '83.

98. **MILFORD,** Oakland Co. (1,138.) Built in '95 by village; put in operation in Dec. Engr., H. H. Humphrey, Detroit. Plant operated by Milford Electric Light Co. for $2,200 per yr., under 5-yr. contract. SUPPLY.—Five wells, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington non-comp. high-pressure. DISTRIBUTION.—Mains, 5 miles; cost extensions met by general fund. Taps, 70; made by village to curb for $7. Services, ¾-in. galv. i.; paid for by consumer. Village can compel use of meters and any consumer may have one. Hydrants, public, 31. PRESSURE.—Ordinary, 55 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $19,000. Bonded debt, $18,000 (?) at 5%, due $6,000 at end of 10, 15 and 20 yrs., each (bonds not rept., but bids were invited in July, '95, for bonds as above.) Expenses: Operating, $2,200 (see above); int., $900. Revenue, City, fire protection, none. MANAGEMENT.—Prest., J. N. Weaver; Secy., Geo. P. McCoy; Treas., M. A. Whittemore. Rept. by Secy., June 18, '96. SEWERS.—Has storm sewers only.

99. **MIO,** Oscoda Co. (Est., 150.) Built in '89 by Mio Water Co. CHARTER.—25 yrs.; provides for purchase of works by city. Rates not fixed in charter. SUPPLY.—Spring Creek, pumping to reservoir. DISTRIBUTION.—Mains, 0.6 miles. Taps, 18. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 2,000. FINANCIAL.—Cost, $2,844. Cap Stock, $10,000. No debt. Expenses, $36: Operating, $33; taxes, $3. Revenue, $1,095: Consumers, $95; City, fire protection, $1,000. MANAGEMENT.—Rept. by Secy. and Supt., Jno. Randall. NOTE.—Inquiry returned stating "works have not been enlarged since last Manual was published and continue in the present ownership. The only change is that there are 50% more service connections" (which would make 18, if previous rept. was correct).

100. **MONROE,** Monroe Co. (5,258.) Built in '89 by Monroe Water Co. FRANCHISE.—30 yrs. from '89; provides for purchase of works by city at any time within 25

yrs. and that if not bought at end of period, city shall buy works at appraised value. City to pay $5,700 for 137 hydrants. SUPPLY.—Lake Erie, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. Bituminous lump coal used; av. cost, $2.20 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 23 miles. Taps, 600; made by Co. at cost. Services, galv. i. Meters: 40; owned by consumer; controlled and repaired by Co. Hydrants, public, 137; private, 5. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $136,000. Bonded debt, $136,000, at 6%. Expenses, $13,113; Operating, $4,170; int., $8,200; taxes, $743. Revenue, $12,687: Consumers, unmetered, $6,487; metered, $500; City, fire protection, $5,700. MANAGEMENT.—Prest., Geo. Spalding; Secy., C. W. Scott; Treas., E. H. York. Rept. by Supt., J. C. Sterling, June 5, '96. SEWERS.—None.

F 5. **MONTAGUE,** Muskegon Co. (1,623.) Built by village for fire protection and lawn sprinkling; put in operation Oct., '94. Supply, springs.

101. **MOUNT CLEMENS,** Macomb Co. (4,748.) Built in '88-9 by city. SUPPLY.—Clinton River, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Blake dup. comp. Bituminous lump coal used; av. cost, $3 per short ton. FILTERS.—Cap., 1,000,000 galls.; American (New York). FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 11½ miles; cost extensions met by appropriations. Taps, 495; made by city at $8 up to ¾-in. Services, lead; paid for by consumer. Meters: 72; owned, controlled and repaired by city. Use of meters compulsory for all large consumers. City can compel the use of meters and any consumer may have one. Hydrants, public, 122; private, 3. CONSUMPTION.—(Galls.) av., 600,000; max., 1,300,000; min., 400,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $70,000. Floating debt, $35,000, at 5%, payable $3,000 each year. Expenses: Operating, $7,420. Revenue: City, fire protection, none; street sprinkling, $50; public buildings, $25. Deficits of $1,000 met by taxation. MANAGEMENT.—Prest., J. F. Upleger; Secy., Spencer J. Dalley; Treas., J. H. Westendorf. Rept. by Supt. and Ch. Pump. Engr., H. H. Orbets, Aug. 8, '96. SEWERS.—Has sanitary and storm sewers.

102. **MOUNT PLEASANT,** Isabella Co. (2,701.) Built in '82-3 by village. SUPPLY.—Well, pumping to tank and in case of fire direct. Well (in '89) 17½ ft. in diam. for 20 ft., then 6 ft. in diam. for 8 ft., then one 6-in., two 3-in. and one 2-in driven wells in bottom PUMP.—Cap., 2,600,000 galls.; Deane water-power. (Cap. includes 1,000,000 rept. by makers as added in '92.) TANK.—Cap., 176,250 galls.; cedar; 20 × 16 ft.; 75 ft. above pumps, 45 ft. above highest part of town. DISTRIBUTION.—Mains, 4.5 miles. Taps, 200. Hydrants, public, 28. PRESSURE.—Ordinary, 25 lbs.; fire, 80 to 100 lbs. FINANCIAL.—(In '88.) Cost $45,500. Debt, $15,000, at 5%. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, July 28, '83.

103. **MUSKEGON,** Muskegon Co. (22,702.) Built in '74-5 by city. SUPPLY.—Lake Michigan, pumping direct. Intake crib is 5,000 ft. from shore. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Holly vert. high duty. Youghiogheny bituminous coal used; av. cost, $2.45 per short ton. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 33 miles; cost extensions met by water fund. Taps, 2,800; made by city for $2.75. Services, galv. i.; paid for by consumer. Meters: 5; owned, controlled and repaired by city. Use of meters compulsory for manufacturers and hotels. City cannot compel general use of meters and consumers may not have them. Hydrants, public, 461; private, 20. CONSUMPTION.—(Galls.) av., 2,600,000; max., 4,887,137; min., 1,964,000. PRESSURE.—Ordinary, 40 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $264,500. Total Bonded Debt for all city departments, $500,000. Expenses, Operating, $18,000; int., $12,500. Revenue, $21,329: Consumers, unmetered, $20,825; metered, $175; City, fire protection, none; street sprinkling, $100; public buildings, $200; other purposes, $29. Deficits are all met by general taxation. MANAGEMENT.—Prest., L. A. Smith; Secy., P. P. Schnorbach; Treas., Leonard Eyke; Supt., Jno. McCullom; Ch. Pump. Engr., Aug. Britscher. Rept. by Secy., Nov. 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 1, '83.

104. **NASHVILLE,** Barry Co. (1,029.) Built in '92 by village. Information refused. Makers rept. Hughes pump.

105. **NEGAUNEE,** Marquette Co. (6,078.) Built in '82-3 by city. SUPPLY.—Teal Lake, pumping direct. Lake is two miles sq., 35 deep, with muddy bottom. PUMPS.—Caps., 3,000,000 galls.; 2—1,500,000 Worthington, one being a comp. non-cond. Bituminous coal used; av. cost, $3.30 per short ton. FISCAL YEAR CLOSED Mar. 20. DISTRIBUTION.—Mains, 14½ miles; cost extensions met in rentals. Taps, 700; made by city at $7 for ½-in., $12 for ¾-in. connection. Services, lead; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 63. CONSUMPTION.—(Galls.) av., 800,000; max., 1,000,000; min., 600,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost (in '89), $50,000. Bonded debt (in '90), $20,000. Expenses, Operating, $5,000. Revenue, Consumers, $7,685. MANAGEMENT.—Mayor, P. B. Kirkwood; Clk., Jas. A. Johnson. Rept. by Supt. and Ch. Pump. Engr., J. A. Wasmuts, June 11, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 30, '85.

106. **NEWAYGO,** Newaygo Co. (1,330.) Built in '84 by village. SUPPLY.—Well,

pumping direct. In case of fire water is pumped from Muskegon River by water-power. PUMPS.—Cap., 750,000 galls.; two Walker. DISTRIBUTION.—Mains, 1.5 miles. Taps, 45. Hydrants, 14. PRESSURE.—Ordinary (in '89), 40 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $10,000, at 6%. Sinking Fund: $2,000. Expenses, $1,050: Operating, $450; int., $600. Revenue, Consumers, $250. NOTE.—No rept. since '90-91 Manual.

107, 108. **NILES**, Berrien Co. (4,197.)

NILES WATER-WORKS CO.

Owned since '92 by Michigan Trust Co. of Grand Rapids, which bought property at court sale for $18,000 (press rept.); built in '78-9. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. LEGAL DIFFICULTIES.—City annulled hydrant contract a number of yrs. ago, and in '95 (see below) built works. Press rept. in '95 stated city would be sued for large amount of back rental. SUPPLY.—Barren Lake, by gravity to distributing reservoir. RESERVOIR.—Cap., 300,000 galls.; 106 ft. above city. DISTRIBUTION.—(In '90.) Mains, 9 miles. Taps, 300. Hydrants, 50. PRESSURE.—(In '89.), 45 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Michigan Trust Co., Grand Rapids. REFERENCE.—Eng. News, Oct. 28, '82.

CITY WORKS.

Built in '95; put in operation July 1. Des. Engr., G. W. Sturtevant, Jr.; Constr. Eng. M. A. Earl; Contrs., J. H. Agnew & Co., all of Chicago. SUPPLY.—Driven wells, 80 and 100 ft. deep, pumping direct and to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Gordon water-power. STAND-PIPE.—Cap., 258,500 galls.; steel, 20 × 110 ft. DISTRIBUTION.—Mains, 16 miles; cost extensions met by appropriations from city council. Taps, 300; made by city, including service to curb, for $4.80. Services, galv. i.; paid for by consumer. Meters: 1; owned, controlled and repaired by city; yearly rental, 15 to 25 cts. per month. City can compel the use of meters and any consumer may have one. Hydrants, public, 143; private, 4. CONSUMPTION.—(Galls.) av., 350,000; max., 400,000; min., 200,000. PRESSURE.—Ordinary, 55 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $75,000, at 5%. Expenses, Operating, $2,000; int., $3,750. Revenue: Consumers, unmetered, $1,500; metered, $4; street sprinkling, $200. Deficits are all met by general taxation. MANAGEMENT.—Bd. of Pub. Wks. Prest., W. G. Blish; Secy., J. L. Cooper; Ch. Pump. Engr., Edwin Bair. Rept. by Supt., M. A. Earl, June 5, '96. SEWERS.—Has partial systems of sanitary and storm sewers.

109. **NORTH MUSKEGON**, Muskegon Co. (1,590.) Built in '85-6 by village. SUPPLY.—Rain Lake and driven wells, pumping direct. PUMPS.—Cap., 1,000,000 galls.; two Walker. DISTRIBUTION.—(In '88.) Mains, 3.5 miles. Taps, 150. Meters, 0. Hydrants, public, 60. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—(In '88.) Cost, $30,000. Bonded debt, $23,000: $15,000 at 6%, $8,000 at 5%. Expenses, $3,300; Operating, $2,000; int., $1,300. Revenue, Consumers, $1,000. NOTE.—No rept. since '90-1 Manual.

110. **NORTHVILLE**, Wayne Co. (1,573.) Built in '92 by city. Engr., Wm. S. Parker, Pontiac; Contrs., Lansing Iron & Engine Wks. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 8 miles; cost extensions met by tax. Taps, 2; made by city for $8. Services paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 54. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $38,000: $30,000 at 5%, due 1923; 8,000 at 6%, due in 5 years. Expenses, Operating, $175. Revenue, Consumers, $1,400. Deficits are met by taxation. MANAGEMENT.—Prest., Wm. H. Ambler; Secy., Wm. H. Nichol. Rept. by Prest., June 16, '96. SEWERS.—None.

111. **NORWAY**, Dickinson Co. (Est., '90, 3,537.) Built in '92 by city. Contrs., Michigan Pipe Co. SUPPLY.—Pumping (from receiving reservoir, direct?). PUMPS.—Cap., 1,700,000 galls.; two Deane comp. dup. RESERVOIR.—Is 40 × 20 ft. DISTRIBUTION.—Mains, about 5 miles. Hydrants, 57. FINANCIAL.—Contract price, $29,706. NOTE.—Rept. by Contrs., Aug. 11, '92; subject to revision.

112. **ONTONAGON**, Ontonagon Co. (Township, 1,564.) Combined water and electric light plant; built in '94 by city. Engr., C. F. Loweth, St. Paul. Contrs., (for W.-W.), Fairbanks, Morse & Co., St. Paul. SUPPLY.—Lake Superior, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Fairbanks, Morse & Co., dup. TANK.—Cap., 100,000 galls.; wood, on 84-ft. steel tower. DISTRIBUTION.—Mains, 4 miles. Hydrants, 49. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Contract price (W.-W.), $22,480. MANAGEMENT.—Supt., Frank C. Moss. Rept. by Engr., in '96. SEWERS.—None. NOTE.—Aug. 25, '96, town was almost wholly burned; power-house was left standing.

113. **OSCODA**, Iosco Co. (3,593.) Built in '86 by city. SUPPLY.—Lake Huron, pumping direct. PUMPS.—Cap., 1,500,000 galls.; two Blake. DISTRIBUTION.—Mains, 4 miles. Taps, 310. Hydrants, 34. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $28,300. Bonded debt, $7,500. Expenses, $3,010: Operating, $2,505; int., $505. Revenue, Consumers, $1,000. NOTE.—No rept. since '90-1 Manual.

114. **OTSEGO**, Allegan Co. (1,626.) Built in '88 by village. SUPPLY.—Kalamazoo River, pumping direct. PUMPS.—Cap., 1,500,000 galls.; two Walker. DIS-

TRIBUTION.—Mains, 4½ miles. Taps, 146. Hydrants, public, 30. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 180 lbs. FINANCIAL.—Cost, $17,000. Bonded debt, $5,000, at 6%. Expenses, $200. Revenue, $477. MANAGEMENT.—Fire Dept., H. H. Jackson. Rept. by Supt., J. F. Derhammer, Oct. 19, '96.

115. **OVID,** Clinton Co. (1,428.) Built in '88 by village. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Gordon & Maxwell. TANK.—Cap., 60,000 galls.; on 60-ft. wood trestle. Built in '93. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. DISTRIBUTION.—Mains, 4.5 miles. Taps, 125. Hydrants, 34. FINANCIAL.—Cost, $15,000. Bonded debt, $15,000, at 5%. Expenses, $3,658. Revenue, $1,211: Consumers, $411; R. R., $500; Mill Co., $300. NOTE. — No official rept. since '90-1 Manual.

116. **OWOSSO,** Shiawassee Co. (6,564.) Built in '89 by village. SUPPLY.—Wells and river, pumping direct. Press repts. state that 400,000-gall. reservoir was built in '95-6, near pumping station, and that it leaked and its banks slid in. PUMPS.—Cap., 2,000,000 galls.; two Gordon comp. non-cond. DISTRIBUTION.—Mains, 15 miles. Taps, 407. Hydrants, 119. FINANCIAL.—Cost, $80,000. Bonded debt, $75,000. Expenses, Operating, $3,300. Revenue, Consumers, $2,200. NOTE.—No official rept. since '90-1 Manual.

117. **OXFORD,** Oakland Co. (1,128.) Combined water and electric light plant; built in '95 by village; tested July 20. Engr., W. H. Ashwell, Detroit. Early in the yr. $19,000 water and $6,000 light bonds were for sale; int., 5%.

118. **PENTWATER,** Oceana Co. (1,510.) Built prior to '92 by village. SUPPLY.—Wells for domestic purposes, lake for fire, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Walker. Wood used; av. cost, $1 per cord. DISTRIBUTION.—Mains, 4 miles. Taps, 250; made by village. Services, cast iron; paid for by village. Hydrants, public, 21. CONSUMPTION.—(Galls.) av., 400,000; max., 1,000,000; min., 200,000. PRESSURE.—Ordinary, 40 lbs.; fire, 115 lbs.; FINANCIAL.—Expenses, Operating, $1,900. Revenue, Consumers, $1,300. MANAGEMENT.—Prest., M. A. Rice; Secy., E. Wright; Treas., J. Jacobs; Supt., M. D. Pool. Rept. by Ch. Pump. Engr., P. H. Adams, Sept., 1, '96. SEWERS.—None.

119. **PETOSKEY,** Emmet Co. (2,872.) Built in '81 by village. SUPPLY.—Well, pumping direct and to tank and reservoir for fire protection. PUMPS.—Cap., 3,500,000 (?) galls. In '89, 2,000,000 Knowles dup. water power was rept. Makers rept. 1,500,000 Laidlaw-Dunn-Gordon added in '94. Pumps are operated greater part of year by water power owned by city; during low water steam is used. RESERVOIR.—265 ft. above pumping station. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 7 miles. Taps, 576. Hydrants, public, 37. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—(In '90.) 40 to 80 lbs. FINANCIAL.—Cost, $59,000. Bonded debt, $43,000, at 5%; paid, $2,150. Expenses, Operating, $2,251. Revenue, $4,473. MANAGEMENT.—Bd. of Pub. Wks. Mayor, Eugene L. Rose; Supt., Will S. Cook. Rept. by City Clk., Wilbur F. Lawson, Sept. 30, '96. REFERENCE.—Eng. News, Apr. 28, '83.

120. **PINCONNING,** Bay Co. (885.) Built in '88 by village. SUPPLY.—Pond, pumping direct. PUMP.—Cap., 1,000,000 galls.; Smith & Valle. DISTRIBUTION.—Mains, 1.3 miles. Taps, 13. Hydrants, 15. FINANCIAL.—Cost, $8,500. Debt, $9,300: Floating, $2,300, at 6%; Bonded, $7,000, at 7%. Expenses, Operating, $1,300. Revenue, $175. NOTE.—No rept. since '90-1 Manual.

F 6. **PLAINWELL,** Allegan Co. (1,414.) Built in '70 by village for fire protection. Supply, Kalamazoo River, pumping direct with 400,000-gall. Walker pumps.

121. **PLYMOUTH,** Wayne Co. (1,172.) Built in '93 by village. Engr., W. F. Parker, Rochester. Contr., Robt. Dunn, Detroit. SUPPLY.—Large boiling spring, 4½ miles from and 103 ft. above village, by gravity. FILTERS.—Cap., 1,000,000 galls. or more. RESERVOIR.—Cap., 1,500,000 galls.; storage, two miles from village. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by tax. Taps, 140; made by village for $5. Services, lead and iron; paid for by village. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 50; private, 1. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—Cost, $38,000. Bonded debt, $36,000: $6,000 at 6%, due 1897; $30,000, at 4½%, due in 26 yrs. Expenses: Operating, $100. MANAGEMENT.—Prest., T. C. Sherwood; Secy., Edwin Lauffer; Treas., L. H. Bennett; Supt., R. L. Root. Rept. by Prest., July 31, '96. SEWERS.—None.

122. **PONTIAC,** Oakland Co. (6,200.) Built in '88 by city. SUPPLY.—Artesian wells, 176 ft. deep, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington comp. cond. Ohio bituminous coal used; av. cost, $2.65 per short ton. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 21 miles; cost extensions met by bonds and revenue. Taps, 680; made by city for $8 in unpaved streets and $10 in paved ones. Services, galv. i.; paid for by consumer. Meters: 24; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for hotels, liveries and laundries. City can compel use of meters and any consumer may have one. Hydrants, public, 145. CONSUMPTION.—(Galls.) av., 750,000; max., 1,200,000; min., 550,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $110,000. Bonded debt, $100,000, at 4½%. Sinking Fund, none. Expenses: Operating, $4,500;

int., 4½%. Revenue: Consumers, $6,000; City, fire protection, $5,800; street sprinkling, $50. No deficits. MANAGEMENT.—Prest., Goodman Jacobs; Secy., Howard Linabury; Treas., D. S. Howard. Rept. by Supt. and Ch. Pump. Engr., H. G. Monroe, June 15, '96. PROJECTED IMPROVEMENTS.—Two 8-in. wells under construction. SEWERS.—Under construction.

128. **PORT HURON,** Saint Clair Co. (13,543.) Built in '72 by city. Ft. Gratiot works (built in '86) rept. as now consolidated with these. SUPPLY.—St. Clair River, pumping direct. PUMPS.—Cap., 19,000,000 galls.: 2,000,000 Holly quadruplex; two 5,000,000 and 12,000,000 Holly-Gaskill hor. high duty. Bituminous coal used; av. cost, $2.50 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 55 miles; cost extensions met by net earnings. Taps, 3,228; made by city for $1.50. Services, lead and iron, paid for by consumer. Meters: 45; owned, controlled and repaired by city. Meters are to be introduced generally. City can compel use of meters and any consumer may have one. Hydrants, public, 279; private, 5. CONSUMPTION.—(Galls.) av., 3,854,148; max., 5,820,800; min., 2,516,800. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $435,306. Bonded debt, $300,000, at 5%; $269,000, at 5%. Expenses: Operating, $13,919; int., $14,450. Revenue, $52,699: Consumers, unmetered, $37,213; metered, $4,486; City, fire protection, $11,000. No deficits. MANAGEMENT.—Prest., N. S. Boynton; Secy., Lewis Atkins; City Treas., H. McNutt; Supt., Hugh F. Doran; Ch. Pump. Engr., Wm. H. Avrey. Rept. by Supt., July 11, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Dec. 17, '81.

124. **PORTLAND,** Ionia Co. (1,678.) Built since '90 by a Co. H. C. Hodgkins, Syracuse, repts. he was interested in construction (probably as Engr.). Fire protection works built in '79 by village. Inquiry returned from Portland endorsed: "Referred to J. V. Clarke, White Plains, N. Y.;" but nothing further has been received.

125. **QUINCY,** Branch Co. (1,250.) Built in '94 by village; put in operation Jan. 13, '95. Engr., W. S. Parker, Pontiac. Contr., T. C. Brooks, Jackson. SUPPLY.—6 driven wells, pumping direct. PUMP.—Cap., 250,000 galls.; Fairbanks, Morse & Co. Bituminous coal used. DISTRIBUTION.—Mains, 5 miles; cost extensions met by taxation. Taps, 150; made by village for $6.50. Services, iron; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 42. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $18,000, at 5%, due 1904. Sinking Fund, none. Expenses: Operating, $1,500; int., $900. Revenue: Consumers, $500; street sprinkling, $20. MANAGEMENT.—Prest., C. L. Truesdell; Secy. and Supt., J. B. Vannerdale; Treas., E. M. Brown; Ch. Pump. Engr., F. A. McKenzie. Rept. by Prest., June 18, '96. SEWERS.—None.

F 7. **QUINNESEC,** Dickinson Co. (322.) Built in '86 by town for fire protection. Supply, pumped from iron mine to tanks. Pumps, Knowles. One mile of Wyckoff pipe. Hydrants, 5. Cost, $2,500. No debt. No official rept. since '89-90 Manual. Press repts. in '93 stated works were being extended.

126. **RED JACKET** (P. O. Calumet), Houghton Co. (3,073.) Built in '89 by Calumet & Hecla Mining Co., to supply Red Jacket and Calumet and also mining camp. Village now owns its own water pipes and hydrants, which cost about $40,000; machinery is owned by the Co. SUPPLY.—Lake Superior, pumping direct, through Calumet & Hecla Mining Co.'s pumping plant. PUMPS.—Cap. (in '89), 1,500,000 galls. DISTRIBUTION.—Mains (in '90), 5 miles. FINANCIAL.—Cost (in '89), $50,000. MANAGEMENT.—Rept. by Vill. Clk., Wm. W. Ellis, June 3, '96.

127. **REED CITY,** Osceola Co. (1,776.) Built in '82 by village. SUPPLY.—Well, spring and Hersey Creek, pumping direct. PUMP.—Cap., 1,000,000 galls.; Deane. DISTRIBUTION.—Mains, 2 miles. Taps, 114. Hydrants, 24. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost (in '88), $24,000. Bonded debt, $2,000, at 6%. Expenses: Operating, $1,832; int., $126. Revenue: Consumers, $1,400. Deficits: Revenue from private consumers goes into water fund and deficiency is made up from general fund, proceeds of general taxation. MANAGEMENT.—Three Comrs. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 28, '83.

128. **RICHMOND,** Macomb Co. (1,074.) Built in '95 by city; put in operation Dec. 15. Engr., W. S. Parker, Pontiac. Contr., T. C. Brooks, Jackson. SUPPLY.—Three artesian wells, pumping to stand-pipe. PUMPS.—Cap., 275,000 galls.; 2—137,500 Cook deep well. Bituminous lump coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 84,600 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 70; made by city for $5. Services, iron; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 40. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $19,000. Floating debt, $19,000, at 5%, due semi-annually for from 6 to 25 yrs. MANAGEMENT.—Prest., Jas. E. Witer; Secy., F. W. Burke; Treas., J. Alley Heath. Rept. by Secy., June 18, '96. SEWERS.—None.

129. **ROCHESTER,** Oakland Co. (900.) Built in '95 by village; put in operation July 4. Engr., Wm. S. Parker, Pontiac. Contr., T. C. Brooks, Jackson. SUPPLY.—Five 8-in. flowing wells, 2½ miles from village, 150 ft. head, by gravity. RESERVOIR.—Cap., 125,000 galls.; at wells. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by income or taxes. Taps, 110; made by village

for $4. Services, lead goose neck and galv. i.; paid for by village. Meters, 0. Hydrants, public, 40. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost, $24,700. Bonded debt, $20,000, at 5%; due $5,000 in 1902-6; $5,000 each in 1905-15-25. Sinking Fund, $688. Expenses: Operating, $56; int., $1,000. Revenue: Consumers, unmetered, from July, '95, to Feb., '96, $312. Int. on bonds and floating debt met by taxes; one half balance in w.-wks. fund to be placed in int. and sinking fund at close of fiscal year. MANAGEMENT.—Prest., W. H. Barnes; Vill. Clk., Theo. Dahlmann. Rept. by Supt., J. F. Jackson, June 18, '96. SEWERS.—Has partial systems of sanitary and storm sewers.

F 8. **ROCKFORD,** Kent Co. (Est., 753.) Built in '96 by city for fire protection and street sprinkling. Engr., A. D. Smith, Rockford. Contr., M. Walker, Fenton. SUPPLY.—Spring Creek, pumping to tank for sprinkling purposes and direct in case of fire. PUMPS.—Cap., 1,000,000. DISTRIBUTION.—Mains, 3 (?) miles. Hydrants, 25. FINANCIAL.—Cost, $10,500. MANAGEMENT.—W.-W. Com.: W. F. Hessler, A. D. Smith, W. P. Dockeray. Rept. by Vill. Clk., J. M. Spore, Oct. 26, '96.

130. **ROMEO,** Macomb Co. (1,687.) Built in '92 by city; put in operation in Aug. Engr., W. S. Parker, Pontiac; Contrs., Snyder & Williams, Dayton, O. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 750,000 galls; Hughes comp. dup. Av. cost of coal used, $3.35 per short ton. RESERVOIR.—Receiving (?); 6 × 125 × 175 ft. STAND-PIPE.—Cap., 94,000 galls.; iron; 20 × 40 ft. FISCAL YEAR CLOSED Jan., '96. DISTRIBUTION.—Mains, 8 miles. Taps, 266; made by city for $5. Services, galv. i.; paid for by consumer. Meters, 1; owned and controlled by city. Use of meters optional with consumer. Hydrants, public, 71. CONSUMPTION.—(Galls.) av., 175,000; max., 200,000; min., 100,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $36,000. Bonded debt, $28,000; $2,000 payable each yr. Expenses, Operating, $1,500. Revenue, $1,550. MANAGEMENT.—Prest., A. Kennedy. Rept. by Secy., B. N. Seaman, June 17, '96. SEWERS.—Has storm sewers only.

131. **ROSCOMMON,** Roscommon Co. (511.) Built in '83 by town. SUPPLY.—Spring Creek, pumping to tank. PUMPS.—Two Deane, one of which is driven by wind power. TANK.—Cap., 45,500 galls.; wood; 22 × 16 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 30. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—(In '89.), 40 lbs. FINANCIAL.—Cost, $5,000. No debt. Expenses, $500. Revenue, $100. MANAGEMENT.—Chn., Henry H. Woodruff; Secy., Jno. L. Smythe; Supt., Jno. Tyrrell. Rept. by Secy., Sept. 26, '96.

132. **SAGINAW,** Saginaw Co. (46,322.) Built in '72-3 by city. Works built by East Saginaw in '73 have been consolidated with these by annexation. SUPPLY.—Saginaw River, pumping direct. PUMPS.—Cap., 24,000,000 galls. East side: 6,000,000 Holly quadruplex and 12,000,000 Holly-Gaskill hor. high duty. West side: 2,000,000 Holly quadruplex and 4,000,000 Holly-Gaskill hor. high duty. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 82 miles. Taps, 3,122; made by city; ⅝-in. for $12.25, ¾-in., $13.50, 1-in. $16.50. Services, lead; paid for by city to service box. Meters, 250; owned, controlled and repaired by city. Use of meters optional with city; compulsory for hopper water closets. Hydrants, public, 711; private, 14. CONSUMPTION.—(Galls.) av., 6,678,741. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $858,424. Debt, $542,500: Bonded, $40,000, at 5½%, due from '96 to 1903; $243,500, at 5%, due '96 to 1903; $194,500, at 4½%, due '98 to 1914; $64,500, at 4%, due '97 to 1915. Expenses: Operating, $26,226; int., $25,095. Revenue, $46,300; street sprinkling, $80. MANAGEMENT.—Prest., E. F. Achard; Secy., F. D. Keeler; Supt., John Weller; Ch. Pump. Engrs., east side, F. G. Chefton; west side, R. D. Stewart. Rept. by Secy., June 18, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Dec. 16, '82; source of supply, May 31, '94; East Saginaw plant, Nov. 19, '81.

133. **SAINT CLAIR,** Saint Clair Co. (2,353.) Built in '86 by village. SUPPLY.—Saint Clair River, pumping direct. PUMPS.—Cap., 1,500,000 galls; two Walker. Bituminous lump coal used; av. cost, $2 per short ton. FISCAL YEAR CLOSED in May. DISTRIBUTION.—Mains, 6 miles; cost extensions met by taxation. Taps, 702; made by city. Services, lead; paid for by consumer. Use of meters optional with city. Hydrants, public, 43; private, 3. CONSUMPTION.—(Galls.) av., 480,000; max., 603,000; min., 603,000. PRESSURE.—Ordinary, 30 to 40 lbs.; fire, 100 to 130 lbs. FINANCIAL.—Cost (in '87), $32,500. Expenses, Operating, $3,000. Revenue, $5,920; City, fire protection, $1,720; street sprinkling, $200; other purposes, $4,000. MANAGEMENT.—Supt., C. J. Streit; Ch. Pump. Engr., Lewis Streggon. Rept. by Supt., Sept. 26, '96. SEWERS.—Has sanitary and storm sewers.

134. **SAINT IGNACE,** Mackinac Co. (2,704.) Built in '89 by city. Works are run in connection with an electric light plant. No legal difficulties. SUPPLY.—Lake Huron, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane dup. Wood used. STAND-PIPE.—Cap., 50,000 galls.; iron; 13½ × 60 ft., enclosed with wood, 100 ft. above lake. DISTRIBUTION.—Taps made by consumer for $3. Services, iron from curb; paid for by consumer. Meters, 0. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 180,000; max., 206,000; min., 82,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost (in '90), $38,707. Bonded debt, $40,000, at 5%. Sinking Fund, none. MANAGEMENT.—Prest., A. W. Hulbert; Secy., A. J. Gennell; Treas.,

Fred Kruger; Ch. Pump. Engr., E. D. Blowers. Rept. by Secy., Aug. 15, '96. SEWERS. —None.

135. **SAINT JOHNS,** Clinton Co. (3,127.) Built in '89 by village. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 4,000,000 galls.; Gordon dup. RESERVOIRS.—Cap., 150,000 galls.; 2—75,000 (collecting?). DISTRIBUTION.—Mains, 11.5 miles. Taps, 243. Hydrants, 88. FINANCIAL.—Cost, $57,444. Bonded debt, $60,000, at 5%; due in annual payments of $1,000 after 1900. Expenses: Operating, $3,400; int., $2,625. Revenue, $5,129: Consumers, $1,473; City, $3,656. NOTE.—No rept. since '90-1 Manual.

136. **SAINT JOSEPH,** Berrien Co. (3,783.) Built in '92 by city; put in operation Sept. 11. Engr., A. V. Powell, Chicago, Ill.; Contr., T. W. Newcomer. SUPPLY.—Lake Michigan, through crib, 1,500 ft. from shore and 16-in. intake to pump well; pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls; 2—1,500,000 Hughes comp. Oil used. STAND-PIPE.—Cap., 135,000 galls.; steel; 16 × 100 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 13 miles. Taps, 600; made by inspector for $2. Services, lead; paid for by consumer. Meters, 23; owned, controlled and repaired by city. Use of meters compulsory for hotels, factories and for irrigating. City can compel use of meters and any consumer may have one. Hydrants, public, 93. CONSUMPTION.—(Galls.) av., 342,000; max., 1,129,000; min., 124,140. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $71,000, at 5%; due 1912. Expenses, Operating, $5,301. MANAGEMENT.—Supt., E. H. Kingsley; Ch. Pump. Engr., Wm. Engberg. Rept. by Albert A. Potter, City. Clk., Sept. 1, '96. SEWERS.—Has sanitary and storm sewers.

137. **SAINT LOUIS,** Gratiot Co. (2,246.) Built in '80 by village. SUPPLY.—Flowing wells, pumping direct. PUMPS.—Cap., 1,000,000 galls; 750,000 Walker and two Holly water-power. DISTRIBUTION.—Mains, 2 miles. Hydrants, 32. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $8,000. Revenue, $800. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 18, '82.

F 9, P 1½. **SAND BEACH,** Huron Co. (1,046.) Built in '81 by J. Jenks & Co. for fire protection only. Supply, Lake Huron, pumping direct; 1—1,500,000 Deane and one Worthington. Pressure, 80 lbs. Rept. by I. G. Puddock, June 6, '96. In '89 there were 8 miles of pipe and 12 hydrants. Reference, Eng. News, Mar. 10, '83.

PROJECTED WORKS.

Mar. 7, '97, village voted $16,000 bonds for works. Bids probably to be received in Apr. Supply, lake. Rept. by Vill. Prest., I. G. Puddock, Mar. 8, '97.

138. **SAULT SAINTE MARIE,** Chippewa Co. (5,760.) Built in '68 by city. SUPPLY.—Sault Sainte Marie River, pumping direct. July 20, '93, bids were received for a 2,000-ft. river intake and a 35 × 80-ft. stand-pipe. PUMPS.—Cap., 4,500,000 (?) galls. Makers rept. 2,500,000 Worthington comp. cond.; press rept. states that in '95 a 2,000,000-gall. pump, driven by electric motor, was added to replace old Walker pump. DISTRIBUTION.—Mains, 8.8 miles. Taps, 480. Meters, 0. Hydrants, 59. PRESSURE.—(In '89.) Ordinary, 35 lbs.; fire, 75 to 90 lbs. FINANCIAL.—Cost, $58,871. Debt, $50,000. Bonded debt, $40,000, at 6½%; $10,000, at 6%. Expenses, $8,081: int., $3,240. Revenue: Consumers, $5,270. SEWERS.—Has sewers. NOTE.—No official rept. since '90-1 Manual.

P 2. **SCOTTVILLE,** Mason Co. (147.) Bids were to be received by town Jan. 4, '97, for works including deep well pump, 18 × 20-ft. wood tank on 70-ft. steel tower, about 1 mile mains and 8 hydrants. Pumps will be driven by 13-HP. gasoline engine. Engr., Alex. Shaw, Chamber of Commerce Bldg., Chicago. Rept. Dec. 7, '96, by G. H. Reader, Chn. W.-W. Com.

139. **SHELBY,** Oceana Co. (994.) Built in '95 by village. Engr., Geo. C. Morgan, New York Life Bldg., Chicago. Contracts for Downie deep well pump, pipe and hydrants were awarded in Jan., '95, according to rept. from Engr. Press rept., Mar. 28, '95, stated construction of water and electric light plant to cost $20,000 had been started.

F 10. **SHERIDAN,** Montcalm Co. (447.) Built in '82 for fire protection. Supply, Pearl Lake, pumping direct, with Blake pump. Mains, ½ mile. Hydrants, 4. Pressure, 50 to 100 lbs. Cost, $3,500. No rept. since '89-90 Manual.

140. **SOUTH HAVEN,** Van Buren Co. (1,924.) Built in '92 by village; put in operation in July. Engr., Geo. S. Pierson, Kalamazoo. Contrs., Lansing Iron & Engine Works. SUPPLY.—Horizontal Cook wells, pumping to stand-pipe. Wells pushed into sand 8 ft. below bed of Lake Michigan; 8-in., 150 ft. long. PUMPS.—Two Hughes. STAND-PIPE.—Cap., 140,000 galls.; 15 × 100 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 130. Meters, 0. Hydrants, 63. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $37,000. Bonded debt, $40,000, at 5%. MANAGEMENT.—Vill. Clk. (June 18, '96), E. I. Hewson. Rept. by Supt., H. E. Dewey, Mar. 28, '98. SEWERS. —None. REFERENCE.—Wells, illus., Eng. News, May 11, '93.

F 11. **SPARTA,** Kent Co. (904.) Sparta Water Co. built system in '91 for fire protection only. Cost, $10,000.

141. **STAMBAUGH,** Iron Co. (Township, 711.) Built in '90 by village. SUPPLY.—Iron River, pumping direct. DISTRIBUTION.—Mains, 1.5 miles. Taps, 6. Services,

iron. Hydrants, 10. PRESSURE.—Ordinary, 100 lbs.; fire, 175 lbs. FINANCIAL.—Cost, $5,000. Bonded debt, $5,000, at 7%. NOTE.—No rept. since '90-1 Manual.

F 12. **STANDISH,** Arenac Co. (611.) Small fire plant built by village in '95. Pump located in and operated by mill. Rept. by Vill. Prest., Nelson Ireland, in '96.

142. **STANTON,** Montcalm Co. (Est., 1,352.) Built in '85 by village. SUPPLY.—Flowing well, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Walker. Wood used; av. cost, $1 per cord. RESERVOIRS.—Two; one 45 × 22 × 10 ft. deep; other 16 × 12 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 300; made for 75 cts. Hydrants, public, 60. CONSUMPTION.—(Galls.) max., 200,000; min., 50,000. PRESSURE.—Ordinary, 60 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $15,000. Expenses: Operating, $1,500. Revenue: Street sprinkling, $52. MANAGEMENT.—Secy., I. Colman; Treas., M. Bachman. Rept. by Supt. and Ch. Pump. Engr., Chas. F. Busch, June 9, '96. SEWERS.—Is partially sewered.

143. **STURGIS,** Saint Joseph Co. (2,489.) Built in '89 by city. SUPPLY.—Well, pumping direct. Two 6-in. wells added in '94. PUMPS.—Cap., 1,750,000 galls.; 2—675,000 Gordon. DISTRIBUTION.—Mains, 7.5 miles. Taps, 252. Hydrants, 54. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $30,358. Bonded debt, $30,000, at 5%. Expenses, $2,978: Operating, $1,478; int., $1,500. Revenue: Consumers, $2,637. NOTE.—No rept. since '90-1 Manual.

144. **TECUMSEH,** Lenawee Co. (2,810.) Built in '77 and rebuilt in '92 by village. SUPPLY.—Wells, pumping to stand-pipe. STAND-PIPE.—Height, 120 ft. (press rept.). DISTRIBUTION.—Mains, 8½ miles. Hydrants, public, 75. PRESSURE.—(In '89.) 40 lbs. FINANCIAL.—Cost, $35,000. Debt, $34,000. Expenses, $1,418. Revenue, $1,074. MANAGEMENT.—Comrs. Clk., W. J. Ingersoll; Supt., Henry Heesen. Rept. by Clk., Sept. 24, '96.

—? **THOMPSONVILLE,** Benzie Co. (Est., 667.) Built in '95 by village (for general supply?) SUPPLY.—Driven wells, pumping direct. FINANCIAL.—Cost, $1,500. MANAGEMENT.—Rept. by W. J. B. Franklin, July 30, '96.

145. **THREE OAKS,** Berrien Co. (885.) Under construction in '96 by village; to be in operation about Jan. 1, '97. Engr., Geo. C. Morgan, New York Life Bldg., Chicago. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 250,000 galls.; Deane "artesian engine." TANK.—Cap., 25,000 galls.; about 100 ft. high (press rept.). Hydrants, 29. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Bonds voted, $10,500. MANAGEMENT.—Vill. Prest., E. K. Warren. Rept. by Clk., F. B. Hinchman, Nov., '96.

146. **THREE RIVERS,** Saint Joseph Co. (3,181.) Built in '82 by village; enlarged in '94. SUPPLY.—Nine 4-in. driven wells 96 ft. deep, pumping direct. PUMPS.—Cap. (in '89), 1,500,000 galls.; two Walker. Press rept., Aug., '94, stated contract had just been let for two Barr pumps. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles. Taps, 425. Hydrants, public, 81. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—(In '89.) Ordinary, 35 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $16,000, at 5%. Expenses, $2,500: Operating, $1,700; int., $800. Revenue: Consumers, unmetered, $2,200. MANAGEMENT.—Prest., J. W. French; City Clk., Fred. J. McMurtrie; Supt., E. M. Burgert. Rept. by City Clk., Sept. 24, '96.

147, P 3. **TRAVERSE CITY,** Grand Traverse Co. (4,353.) Built in '81-2 by H. D. Campbell & Sons. FRANCHISE.—20 yrs. from '82. Provided for purchase of works by city in '96, price to be determined by arbitration. Rates must be approved by city council. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Grand Traverse Bay, pumping direct. PUMPS.—Cap., 8,000,000 galls.; 2—1,500,000 Walker and 2—2,500,000. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains (in '90), 7.5 miles; cost extensions met by Co. Taps, 519; made by consumer. Services, galv. i. and lead; paid for by consumer. Meters owned, controlled and repaired by Co. Hydrants, public, 80; private, 4. CONSUMPTION.—(Galls.) av., 1,800,000; max., 1,800,000; min., 800,000. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. One steam fire engine is used. FINANCIAL.—Cost, $82,000. Expenses: Operating, $6,000. Revenue, $14,150: Consumers, $8,662; city, fire protection, $5,838; street sprinkling, $250. MANAGEMENT.—Pres., H. D. Campbell; Secy., W. H. Campbell; Treas., D. H. Campbell; Supt., D. F. Campbell; Ch. Pump. Engr., H. O. Joynt. Rept. by Supe., June 30, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 3, '83.

PROJECTED WORKS.

Com. appointed in '96 to investigate subject of municipal works and to rept. to council by Feb. 1, '97. Rept. by Cy. Engr., H. F. Northrup, Dec. 22, '96. Nov. 8, '96, R. G. Gordint, Mem. Bd. Pub. Wks., rept. he was urging construction of $100,000 plant. Mar. 4, '97, Cy. Engr. rept. Geo. W. Rafter, Rochester, N. Y., had been appointed Consult. Engr.

148. **TRENTON,** Wayne Co. (789.) Built in '96 by village; put in operation July 20. Engr., Patrick Keating, Detroit. Contrs., McCoy & Keating, Detroit. SUPPLY.—Detroit River, pumping direct. PUMP.—Cap., 500,000 galls.; Worthington fire. DISTRIBUTION.—Taps, 160; made by city for $7. Meters, 0. Hydrants, public, 20. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $11,300. Bonded debt,

$8,900 at 6%, due in 10 yrs. Sinking Fund, $385. MANAGEMENT.—Prest., H. Holden; Secy., N. A. Maus; Treas., Jas. Bailey; Supt., K. J. Sundstrom; Ch. Pump. Engr., D. Reamus. Rept. by Secy., Oct. 28, '96. SEWERS.—None.

149. **UNION CITY,** Branch Co. (1,156.) Built in '95 by village; put in operation May 1. Engr., W. S. Parker. Contr., A. Whitney & Son. Electric light plant is operated in connection with water-works. SUPPLY.—Wells, pumping direct. PUMPS.—Smith-Vaile. DISTRIBUTION.—Mains, 7 miles. Taps, 173; made by village for $5. Services paid for by consumer. Meters, 0. Hydrants, public, 50. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $21,000. Bonded debt, $20,000, at 5%, due 1905 and thereafter at $2,000 a yr. Expenses: Operating, $800 (est.). Revenue: City, fire protection, $1,200. MANAGEMENT.—Council. Ch. Pump. Engr., D. L. Stoney. Rept. by D. J. Easton, Aug. 6, '96. SEWERS.—None.

150. **VASSAR,** Tuscola Co. (1,682.) Built by village; put in operation Jan. 1, '89. SUPPLY.—Five artesian wells and Cass River, pumping to stand-pipe and direct. PUMP.—(In '89.) Cap., 1,500,000 galls.; Holly hor. dup. STAND-PIPE.—(In '89.) Cap., 105,000 galls.; 15 × 80 ft. DISTRIBUTION.—Mains, 5.5 miles. Taps, 146. Hydrants, 55. CONSUMPTION.—(Galls.) av., 56,000. PRESSURE.—(In '89.) Ordinary, 75 lbs.; fire, 160 lbs. FINANCIAL.—(In '90.) Cost, $32,000. Bonded, $30,000, at 5%. Expenses, $2,450: Operating, $950; int., $1,500. Revenue: Consumers, $1,200. MANAGEMENT.—Comrs. Chn., J. A. Trotter; Supt., W. J. Bennett. Rept. by Clk., Chas. C. Hill, Sept. 26, '96.

151. **VICKSBURG,** Kalamazoo Co. (921.) Built by village; put in operation Jan. 1, '97. Engrs., Alvord & Shields, The Rookery, Chicago. Contrs., Flinn & Hulscher and H. M. Brooks. SUPPLY.—Three 6-in. wells, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Smith-Vaile. DISTRIBUTION.—Mains, 3¼ miles. Meters, 0. Hydrants, public, 23. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $15,500, at 5%. No Sinking Fund. MANAGEMENT.—Prest., Jno. Long; Secy., F. A. Robinson; Treas., E. L. Page; Supt., H. A. Sisson. Rept. by Ch. Pump. Engr., Geo. Chamberlain, Dec. 30, '96. SEWERS.—No sanitary sewers.

F 13. **WAKEFIELD,** Gogebic Co. (Township, 782.) Built in '94-5 by village for fire protection. Supply, Sandy Lake. Cost, $5,000. Rept. by A. Schindler, Aug. 8, '96.

P 4. **WAYNE,** Wayne Co. (Est., 1,555.) Village has voted $12,000 bonds for works. Engr., H. H. Humphrey, Detroit. Supply, wells, pumping to reservoir. Unsigned rept., Dec. 12, '96. Other repts. indicate that bonds were voted in Nov., '95, and that project has been hanging fire.

152. **WEST BAY CITY,** Bay Co. (12,981.) Built in '80-3 by city. SUPPLY.—Saginaw River, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly-Gaskill hor. high duty. cond. Hocking Valley coal used; av. cost, $2.55 per short ton. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 13 miles. Taps, 450; made by city, ½-in. for $3, ⅝-in. for $3.50, ¾-in. for $4 and 1-in. for $5. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 149; private, 17. CONSUMPTION.—(Galls.) av., 1,255,242. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost (in '89), $79,734. No debt. MANAGEMENT.—Chn. of Com., Frank H. Davis; Secy., Geo. L. Lusk; Treas., R. C. Tasker; Supt., G. Kubach; Ch. Pump. Engr., Henry Knowlton. SEWERS.—Has sanitary and storm sewers.

F 14. **WESTON,** Lenawee Co. (Est., 275.) Small fire protection plant built in '95 by Weston Water-Works Co., composed of business men, to protect central part of town. Supply, pumped by windmill to tank. Cost, $600. Prest., E. B. Lee.

153. **WHITE CLOUD,** Newago Co. (743.) Built in '86 by village. SUPPLY.—White River, pumping direct. PUMPS.—Cap. (in '89), 25,000 galls. DISTRIBUTION.—Mains, 3 miles. Hydrants, public, 16. PRESSURE.—(In '89.) 40 to 75 lbs. FINANCIAL.—Cost, $13,500. Expenses: Operating, $425. Revenue, $700. MANAGEMENT.—Vill. Clk., L. A. Bracy; Supt., Thos. Herron. Rept. by Vill. Clk., Sept. 24, '96.

154. **WHITEHALL,** Muskegon Co. (1,903.) Built in '91 by village; put in operation Mar. 1. SUPPLY.—Wells, with lake for fire protection, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Walker. Wood used. FILTERS.—Cap., 1,500,000 (?) galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by tax. Taps, 140; made by village for $7. Services, galv. i.; paid for by consumer. Meters, 6; owned and repaired by consumer; controlled by village. Use of meters compulsory for mill owners. Village can compel use of meters and any consumer may have one. Hydrants, public, 50; private, 30. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $10,000, at 6%, due 1900. Expenses: Operating, $1,300; int., $500. MANAGEMENT.—Prest., E. M. Ruggles; Secy., Frederic Norman; Treas., Geo. Hahler; Ch. Pump. Engr., G. C. Dean. Rept. by Supt., Chas. Dean, June 10, '96.

155. **WYANDOTTE,** Wayne Co. (3,817.) Built in '89-90 by city. SUPPLY.—Detroit River, pumping direct. PUMPS.—Cap., 6,000,000 (?) galls.; 3,000,000 Hughes, given in '89-90 Manual; makers rept. 3,000,000 Laidlaw-Dunn-Gordon added in '91. DISTRIBUTION.—Taps, 462. Hydrants, public, 98. CONSUMPTION.—(Galls.) av., 276,000. FINANCIAL.—Cost (in '90), $61,371. Bonded debt, $60,000, at 5%. Expenses:

Operating, $35; int., $3,000. Revenue, $7,448. MANAGEMENT.—Chn., Dr. T. J. Langlois; Secy., E. C. Bryan; Supt., H. N. Ocobock. Rept. by Secy., Sept. 24, '96.

156. **YPSILANTI,** Washtenaw Co. (6,129.) Built in '89 by city. SUPPLY.—Four wells at springs, pumping to tank. First well was 30 × 30 ft. PUMPS.—Cap., 5,500,000 galls.; 2,000,000 and 3,500,000 Laidlaw-Dunn-Gordon, erected in '91 and '96, respectively. TANK.—Cap., 250,000 galls.; stone, 40 × 27 ft., on masonry tower 90 ft. high; covered. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Taps, 1,190. Services, galv. i.; paid for by city. Meters, 8; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 140. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $130,000. Bonded debt, $125,000, at 5%, due 30 yrs. from '89. MANAGEMENT.—Prest., H. M. Curtis; Secy., Geo. A. Cook; Supt., Robt. Sinners; Ch. Pump. Engr., Adam Trunbelle. Rept. by Secy., July 22, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, May 10, '90.

ILLINOIS.

1. **ALEDO,** Mercer Co. (1,601.) Built in '89 by city. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 75,000 galls.; Cook dup. deep well. Bituminous coal used; av. cost, $2.25 per short ton. TANK.—Cap., 60,000 galls.; wood; 24 × 18 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by special assessment. Taps, 200; made by consumer. Services, ¾-in. galv. i.; paid for by consumer. Meters, 13; owned, controlled and repaired by city; yearly rental, $2. Use of meters optional with consumer; compulsory for livery stables, hotels, court house and laundry. Hydrants, public, 60. CONSUMPTION.—(Galls.) av., 28,000. PRESSURE.—Ordinary and fire, 35 lbs. FINANCIAL.—Cost, $25,000. Expenses: Operating, $1,200. Revenue: Consumers, unmetered, $1,200; metered, $70. Deficits are met by general taxation. MANAGEMENT.—Mayor, G. C. Scott; Treas., R. McDonald; Supt., Robt. Condon; Ch. Pump. Engr., J. S. Whiteside. Rept. by Supt., Aug. '96. SEWERS.—None.

—? **ALEXIS,** Warren Co. (562.) Built in '96 by village; put in operation Mar., '96. Engr., Thos. McClanahan, Monmouth; Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—Driven well, pumping to stand-pipe; pumping is done by electric light co. TANK.—Cap., 47,000 galls., on elevated trestle. DISTRIBUTION.—Hydrants, public, 4; private, 2. FINANCIAL.—Cost, $3,600; street mains, $1,200. MANAGEMENT.—Rept. by Prest. of Vil., Chas. E. Johnson, Aug. 22, '96.

2. **ALGONQUIN,** McHenry Co. (Est., 300.) Built in '95 by city; put in operation Jan. 1, '96. Engr. and Contr., Danl. W. Mead, Rockford, Ill. SUPPLY.—Springs, near Fox River, one mile above city, pumping by hydraulic ram to storage reservoir, 150 ft. above city. PUMP.—Hydraulic ram. RESERVOIR.—Cap., 100,000 galls.; covered, brick, circular, 35 × 14 ft. Supply main, 8-in., 4,000 ft. long. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by revenue. Taps, 30; made by city for $10. Services, lead; paid for by city. Meters, 0; yearly rental, $2. City can compel use of meters and any consumer may have one. Hydrants, public, 16. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 115 lbs. FINANCIAL.—Cost, $10,000. Debt, $2,500; all floating, at 6%. MANAGEMENT.—Water Board: Chas. Wandrack, Jno. Johnston, Chas. Kock; Supt., F. Yerkes. Rept. by E. L. Spence, Dec. 12, '96. SEWERS.—None.

3. **ALTON,** Madison Co. (10,294.) Owned or controlled by New England Water-Works Co.; built in '75 by Alton Water-Works Co. FRANCHISE.—Provides for purchase of works by city. Rates are fixed in franchise. Contract with city expires Nov. 8, 1900. City was to receive bids Mar. 15, '97, for new contract to run 25 yrs. from Jan. 1, 1901, and to include 10,000,000-gall. pumping plant, 2—5,000,000 settling basins and filtration, if necessary, to render water clear. SUPPLY.—Mississippi River, pumping to tank and direct. PUMPS.—Cap., 5,000,000; 2,500,000 Allis, 1,500,000 Worthington and 1,000,000 Deane hor. dup. high pressure. TANKS.—(In '89.) Cap., 300,000 galls.; wood, 40 × 24 ft. and 32 × 16 ft.; 260 ft. above pumps. Also one of iron. FISCAL YEAR CLOSED Dec. 29, '96. DISTRIBUTION.—Mains, 25 miles. Taps, 600. Meters, 60. Hydrants, 135. CONSUMPTION.—(Galls.) av., 1,000,000. FINANCIAL.—Cost, $200,000. Revenue, $10,750. MANAGEMENT.—Prest., T. A. Taylor; Secy., W. A. Underwood; Supt., W. G. Curtis. Rept. by Prest., Dec. 29, '96. PROJECTED IMPROVEMENTS.—New settling basin will be built in spring of '97. REFERENCE.—Eng. News, Oct. 8, '81.

4. **AMBOY,** Lee Co. (2,257.) Built in '94 by city; put in operation Jan., '95. Des. Engr., C. C. Jacobs. Contrs., U. S. Wind Engine & Pump Co., Batavia. SUPPLY.—Artesian well, 2,100 ft. deep, pumping to tank. PUMP.—Deep well; operated in connection with electric light plant of Amboy Lighting & Power Co. Illinois bituminous coal used; av. cost, $2.05 per short ton. TANK.—Cap., 67,680 galls.; pine, 24 × 20 ft., on steel trestle, 80 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1 mile; cost extensions met by private subscription. Taps, 40; made by city. Services, galv. i.; paid for by city to curb line. Meters, none. Hydrants, public, 10; private, 1. CONSUMPTION.—(Galls.) av., 15,000; max., 18,000; min., 12,000. PRESSURE.—Ordinary, 40 lbs.; one steam fire engine in use. FINANCIAL.—Cost, $13,-

400. Debt, none. Expenses: Operating, $500. MANAGEMENT.—City Engr. and Supt., Chas. C. Jacobs; Ch. Pump. Engr., M. Brewer. Rept. by Supt., Oct. 19, '96. SEWERS.—Has storm sewers only.

5. **ARCOLA,** Douglas Co. (1,733.) Built in '92 by city; put in operation in Aug. Engr., G. Sturtevant, Chicago; Contr., T. A. Hardman. SUPPLY.—Wells, pumping with Pohle air lift and other pumps to stand-pipe. PUMPS.—Cap., 350,000 galls.; Worthington dup., and also 216,000 Deane deep well. Anthracite pea coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 100,000 galls.; storage. STAND-PIPE.—Cap., 33,400 galls.; steel, 12 × 40 ft., on brick tower, 65 ft. high; total height, 105 ft. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general taxation. Taps, 200; made by city for $10. Services, galv. i.; paid for by consumer. Meters, 15; owned, controlled and repaired by consumer. Use of meters optional with consumer. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 80,000; max., 140,000; min., 60,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $10,000, at 5%; due in 1902. Sinking Fund, $1,000, not invested. Expenses, Operating, $1,000. No deficits. MANAGEMENT.—Prest., C. E. Ward; Clerk, W. G. Charleton; Treas., G. Manahan; Ch. Pump. Engr., A. Leasman. Rept. by W. Lough, Dec. 30, '96. SEWERS.—Has sanitary and storm sewers.

—? **ARLINGTON,** Bureau Co. (436.) Press rept., June, '95, stated council had just voted to build works. Makers rept. Goulds pump here, driven by gasoline engine. Dec., '96, a citizen rept. that M. Kennedy should be addressed for information, which was done, without response.

P 1. **ASSUMPTION,** Christian Co. (1,076.) People voted bonds for works early in '96, but propery-owners secured injunction; matter unsettled at time of rept. Supply, wells, four miles distant, probably by pumping. Engr., J. S. Nichols, Taylorville. Repts. by Vill. Clk., S. N. Haverfield, June and Aug., '96.

P 2. **ASTORIA,** Fulton Co. (1,357.) Well was completed about Oct. 1, '96, from which it is proposed to pump to stand-pipe as soon as finances of village will permit construction of works. Repts. by Cy. Clk., I. C. Johnson, June, '96, and Engr., Geo. W. Dudley, 11 North St., St. Louis, Mo., late in '96.

6. **ATLANTA,** Logan Co. (1,178.) Built in '92 by city. SUPPLY.—Deep wells, pumping to stand-pipe. PUMPS.— Cap., (?) galls.; two 8-in. Cook deep well. STAND-PIPE.—Cap., 84,600 galls.; steel, 12 × 100 ft. Contrs., Fairbanks, Morse & Co., Chicago. DISTRIBUTION.—Mains, 5 miles; cost extensions met by bonds. Taps, 190; made by consumer. Services, iron; paid for by property owner. Meters, 0. Hydrants, public, 10. PRESSURE.—Ordinary and fire, 35 lbs. MANAGEMENT.—City Council. Rept. by A. W. Chenowith, Dec. 16, '96.

7. **AURORA,** Kane Co. (19,688.) Built in '85 by city. SUPPLY.—Three artesian wells, 1,380, 2,440 and 2,270 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Deane. Pump to be added. Makers. rept. 6,000,000 Nordberg quadruplex, which is probably the new pump. Bituminous coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 289,408 galls.; 18 × 152 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 49 miles; cost extensions met by direct taxation. Taps, 2,900; made by city for $2.50. Services, lead; paid for by consumer. Meters, 1,041; owned and repaired by consumer; controlled by city. Use of meters compulsory for all houses with water closets, all stores and factories. City can compel use of meters and and consumer may have one. Hydrants, public, 430. CONSUMPTION.—(Galls.) av., 1,300,000. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $460,000. Bonded debt, $168,000, at 5%; due $46,000 in 1900, 1905, 1910 and balance later on. Expenses: Operating, $9,884; int., $8,400. Revenue: Consumers, unmetered, $1,759; metered, $1,041. MANAGEMENT.—Bd. Pub. Wks.; Ch. Pump. Engr., Chas. Ganser. Rept. by Supt., M. W. Corbett, July 23, '96. SEWERS.—Has sanitary and storm sewers.

140. **AUSTIN,** Cook Co. (4,051.) Supply from Oak Park.

F 1. **AVON,** Fulton Co. (692.) Built in '92 by Avon Milling & Mfg. Co. Supply, wells, lifted by rotary pump to 47,000-gall. cistern. Mains, ½ mile. Hydrants, 7. Pressure, ordinary, 120 lbs. Cost, $1,000. Prest. and Supt., H. F. Townsend; Secy., Geo. A. Tompkins.

F 2. **BARRY,** Pike Co. (1,854.) Built in '80-1 by village for fire protection, stock watering and street sprinkling.

8. **BATAVIA,** Kane Co. (3,543.) Built in '94 by city. Des. (and Const.?) Engr., Daniel W. Mead, Rockford; Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—Pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Worthington comp. non-cond. (rept. by makers). STAND-PIPE.—Contrs., Corbett & Stadler, Batavia. DISTRIBUTION.—Mains, about 5 miles. NOTE.—Subject to correction; no information since '94.

9. **BEARDSTOWN,** Cass Co. (4,226.) Built in '92 by city. SUPPLY.—Wells, 80 ft. deep, pumping to tank. PUMPS.—Cap., 1,500,000 galls.: 2—750,000 Worthington; a comp. non-cond. and a simple high pressure (rept. by makers.). TANK.—Cap., 40,000 galls. DISTRIBUTION.—Mains, 5 miles. NOTE.—Information from press rept. in '92, except regarding pumps.

10. **BELLEVILLE,** Saint Clair Co. (15,361.) Built in '85 by City Water Co. FRANCHISE.—30 yrs. from '85. City to pay $7,200 per yr. for public service. SUPPLY.—Richland Creek and branch of same, pumping from impounding reservoirs to distributing reservoir and stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington comp. non-cond. Bituminous coal used; av. cost, 87½ cts. per short ton. FILTERS.—Cap., 1,000,000 galls.; Jewell. RESERVOIRS.—Cap., 230,000,000 galls. Impounding: Old, 30,000,000; Lake Christine, 125,000,000. Distributing: No. 3, 75,000,000. STAND-PIPE.—Cap., 158,000 galls.; 15 × 120 ft. DISTRIBUTION.—Mains, 16 miles. Taps, 770; made by Co. Services, lead; paid for by consumer. Meters, 36; owned and controlled by Co. Hydrants, public, 120; private, 6. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 40 lbs.; fire, 140 lbs. FINANCIAL.—Withheld. Cost (in '87), $175,000. MANAGEMENT.—Rept. by Mgr., M. T. Slookey, June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Jewell filters, Eng. News, May 28, '96.

11. **BELVIDERE,** Boone Co. (3,867.) Built in '91 by city. SUPPLY.—Artesian wells, pumping to tank and stand-pipe. PUMPS.—Cap., 3,950,000 galls.: 2—2,250,000 Deane, a dup. and a comp. dup.; 750,000 Gould triplex, driven by steam engine. RESERVOIR.—Cap., 60,000 galls. (receiving?). TANK.—Cap., 42,000 galls.; 124 ft. high on elevation of 48 ft. above pump. STAND-PIPE.—Cap., 128,000 galls. DISTRIBUTION.—Mains, 11 miles. Taps, 475. Hydrants, public, 103; private, 7. CONSUMPTION.—(Galls.) av., 174,000. FINANCIAL.—Cost, $66,062. Expenses: Operating, $2,773. Revenue, $5,144, Consumers, $4,709; other purposes, $435. MANAGEMENT.—Chn., W. H. Moore. Rept. by Supt., E. E. Spooner, Sept. 25, '96.

12. **BEMENT,** Piatt Co. (1,129.) Built in '95 by village; put in operation in April. Engr., J. H. Haskett. Contrs., Fairbanks, Morse & Co., all of Chicago. SUPPLY.—Two 6-in. driven wells, pumping to elevated tank. PUMPS.—Cap., 1,440,000 galls.; dup. Also 2—600,000 deep-well pumps, from Contrs. Bituminous coal used; av. cost, $1.85 per short ton. RESERVOIR.—Cap., 45,000 galls.; storage, at wells. TANK.—Cap., 56,400 galls.; wood; 20 × 24 ft., on brick tower 75 ft. high. FISCAL YEAR CLOSED Apr. 28. DISTRIBUTION.—Mains, 1.8 miles; cost extensions met by special tax. Taps, 70; made by village, including service to curb, for $12. Services, galv. 1.; paid for by consumer. Meters, 8; owned, controlled and repaired by village. Use of meters compulsory for livery stables and Electric Light & Power Co. Village can compel use of meters and any consumer may have one. Hydrants, public, 42; private, 150. FINANCIAL.—Cost, $13,000. Bonded debt, $6,000, at 5%, due 20 yrs. after issue. Expenses: Operating, $950; int., $300. MANAGEMENT.—Prest., A. R. Saylor; Secy., Wm. Houck; Treas., W. T. Bower; Supt., J. T. Moore; Ch. Pump Engr., Frank Torrence. Rept. by Thos. Rhodes, Oct. 24, '96. SEWERS.—None.

13. **BLOOMINGTON,** McLean Co. (20,484.) Built in '75 by city. SUPPLY.—Surface and tube-wells, pumping to stand-pipe and direct. Surface well 40 × 28½ ft., with 18-in. pipe sunk 10 ft. in bottom. Ground at this point is 68 ft. below highest point in city. PUMPS.—Cap., 7,000,000 (?) galls.: A 1,000,000 Worthington non-comp. non-cond. and 2,000,000 Blake, rept. in '89. Makers rept. a 4,000,000 Worthington comp. cond. A 4,000,000 air-lift plant also rept. as installed by E. P. Allis Co. STAND-PIPE.—Cap., 75,000 galls.; 8 × 20 ft., on ground 35 ft. above engine-house floor. DISTRIBUTION.—Mains, 27½ miles. Taps, 1,828. Meters, 1,495. Hydrants, public, 300. CONSUMPTION.—(Galls.) av., 1,200,000. FINANCIAL.—Cost, $300,000. Bonded debt, $15,000, at 8%. Expenses, $12,900. Revenue, $16,420. Expenses were unusually heavy past year, owing to necessary improvements. MANAGEMENT.—Three Comrs. Prest., Harvey Hart; Secy., R. N. Evans. Rept. by Supt., H. W. Schmidt, Dec. 27, '96. REFERENCES.—Eng. News, Dec. 3, '81; Pohle air-lift, Feb. 20, '96, illus.

14. **BLUE ISLAND,** Cook Co. (2,521.) Built in '76 by village. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 1,350,000 galls.; Buffalo makers rept. two air-lifts here, with 12 × 16-in. Rand compressors, installed in '94 and '95. TANK.—Cap., 60,000 galls., on 50-ft. tower. DISTRIBUTION.—(In '88.) Mains, 4 miles. Taps, 175. Meters, 4. Hydrants, 50. FINANCIAL.—(In '88.) Cost, $30,000. Bonded debt, $13,000, at 6%. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 10, '85.

F 8. **BLUE MOUND,** Macon Co. (696.) Built in '86 by village for fire protection. Well, pumping to 25,000-gall. tank and direct. Mains (in '87), Wyckoff wood, 2,000 ft. Hydrants (in '87), 8. Cost (in '87), $3,500. No rept. since '89-90 Manual.

202. **BRISTOL,** Kendall Co. See Yorkville.

15. **BUCKLEY,** Iroquois Co. (433.) Built in '89-90 by village for fire protection only; domestic supply mains laid in '93. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 200,000 galls.; Deming; driven by 5-HP. Otto gas engine. Gasoline used. TANK.—Cap., 12,600 galls.; on wood tower. FISCAL YEAR CLOSED Apr. 17. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by funds. Taps, 6; made by village. Services, lead and iron; paid for by consumer. Village can compel use of meters and any consumer may have one. Hydrants, public, 10; private, 6. MANAGEMENT.—Prest., W. H. Cleave; Secy., J. M. Gross; Treas., J. C. Koehn; Supt., H. Englhausen. Rept. by Secy., Aug. 8, '96. SEWERS.—None.

16. **BUDA,** Bureau Co. (990.) Built in '96 by village; put in operation about Dec. 1. Engr., C. F. Sturtevant, Bushnell. First supplied in '88 by Buda Water-Works

Co.; plant was small and rept. in '90 or '91, as having suspended operations. SUPPLY.—Well, 1,611 ft. deep, pumping to stand-pipe. PUMP.—Downie double acting. Steam is obtained from foundry boilers. STAND-PIPE.—Cap., 58,000 galls.; steel, 10 × 100 ft. Contrs., Chicago Bridge & Iron Co., Washington Heights. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by special assessments. Taps, 5; made by village for $2.50. Services, galv. i.; paid for by village to curb line. Meters, 0. Hydrants, public, 29. PRESSURE.—Ordinary, 4. FINANCIAL.—Cost, about $14,000. Bonded debt, $5,000, at 6%, due in one to four yrs. Special assessment bonds, $6,600. MANAGEMENT.—Prest., J. W. Carper; Secy., P. N. Mason; Treas., G. S. Foster; Ch. Pump. Engr., A. J. Fisher. Rept. by Secy., Dec. 30, '96. SEWERS.—None.

17. **BUSHNELL,** McDonough Co. (2,314.) Built in '89-90 by city. SUPPLY.—Tube wells, 6-in. × 110 ft., pumping to tank. PUMPS.—Cap., 500,000 galls.; Deane, dup. TANK.—Cap., 40,000 galls.; 12 × 52 ft., on tower 52 ft. high. DISTRIBUTION.—Mains, 2 miles. Taps, 200. Meters, 8. Hydrants, public, 25. FINANCIAL.—Cost, $21,000. Bonded debt, $4,000. MANAGEMENT.—Supt., W. H. Whittlesey. Rept. by City Clk., O. C. Hicks, Sept. 24, '96.

18. **CABERY,** Ford Co. (342.) Built in '87 by village. SUPPLY.—Driven well, 240 ft. deep, pumping to tank and direct. PUMP.—Cap., 200,000 galls.; Worthington simple high pressure (rept. by makers). TANK.—Cap., 33,000 galls.; wood ; on stone tower 45 ft. high. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by in revenue from licenses. Meters, 0. Use of meters optional with consumer. Hydrants, public, 14; private, 1. CONSUMPTION.—(Galls.) av., 6,000. PRESSURE.—Ordinary, 22 lbs.; fire, 65 lbs. FINANCIAL.—(In '90.) Cost, $6,800. Debt, $1,000, at 6%. Expenses, $95: Operating, $35; int., $60. Revenue, Consumers, $115. Rept. by P. Whalen, Oct. 27, '96. SEWERS.—Has storm sewers only.

19. **CAIRO,** Alexander Co. (10,324.) Built in '85 by Cairo Water Co. SUPPLY.—Ohio River, pumping to stand-pipe and direct. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Gordon & Maxwell comp. dup. FILTERS.—Cap., 5,000,000 galls.; crib in river built in '94-5; Des. Engrs., Jas. H. Harlow & Co., Pittsburg, Pa. An 800,000-gall. American (New York) filter was installed in '89. STAND-PIPE.—Cap., 263,200 galls.; 16 × 175 ft. DISTRIBUTION.—Mains, 18 miles. Services, galv. or lead; paid for by property owner. Meters: 6; owned and repairs paid by consumer. Use of meters optional with Co. Hydrants, public, 178; private, 20. CONSUMPTION.—(Galls.) av., 2,500,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cap. Stock, $100,000. Bonded debt, $100,000, at 6%. Expenses, $15,000. Revenue, $26,404: Consumers, $20,134; City, $6,270. MANAGEMENT.—Prest., H. B. Melick; Secy. & Treas., H. Hinckley, both of Williamsport, Pa. Rept. by Local Mgr. and Supt., Thos. M. Gannon, July 20, '96. SEWERS.—Has storm sewers only.

20. **CAMBRIDGE,** Henry Co. (940.) Built in '96 by city; put in operation about Nov. 20. Engr., Geo. Cadogan Morgan, Chicago. SUPPLY.—Artesian well, pumping to storage reservoir and tank. PUMPS.—Cap., 600,000 galls: 288,000 Henion & Hubbell deep well; repumped by 600,000 Deane; former operated by 36-HP. Otto gasoline engine. RESERVOIR.—Cap., 85,000 galls.; storage. TANK.—Morgan special. DISTRIBUTION.—Mains, 3 miles. Hydrants, public, 30. FINANCIAL.—Cost, about, $18,500. MANAGEMENT.—Mayor, N. B. Gould; Clerk, J. H. Seaton. Rept. by Des. Engr., Geo. C. Morgan, Dec. 12, '96.

21. **CAMPUS,** Livingston Co. (Est., 200.) Built in '96 by village; put in operation Mar. 1. Engrs. and Contrs., A. Laughlin & Son, Streator. SUPPLY.—Driven well, pumping to tank. PUMP.—Cap., 5,000 galls.; aeromotor. TANK.—Cap., 25,000 galls.; steel; 12 × 30 ft.; on brick tower 13 ft. diam. × 50 ft. high. DISTRIBUTION.—Mains, ¼ mile. Taps, 10. Services, iron; paid for by owner. Meters, 0. Hydrants, public, 6. FINANCIAL.—Cost (rept. by citizen), $4,000. MANAGEMENT.—Prest., M. R. Walsh. Rept. by T. P. Maguire, Dec. 5, '96. SEWERS.—None.

22. **CANTON,** Fulton Co. (5,604.) Built in '84 by town; new well and pumps put in operation Feb. 1, '96. Engr., G. W. Chandler. SUPPLY.—Two artesian wells, pumping to tank. PUMPS.—Cap., 1,872,000 galls.; 432,000 Hooker, and 1,440,000 Knowles dup. Av. cost of coal used, $1.37 per short ton, delivered. TANK.—Cap., 30,000 galls.; on brick tower 90 ft. high. FISCAL YEAR CLOSED May 5. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by taxation. Taps, 300; made by consumer. Services, lead; paid for by consumer. Meters: 300; owned by city and consumers; controlled by city; repairs paid by consumer. Use of meters compulsory for all consumers. Hydrants, public, 82. PRESSURE.—Ordinary, 44 lbs.; fire, 125 lbs. Steam fire engines are used. FINANCIAL.—Revenue: Consumers, unmetered, $580; metered, $2,500; street sprinkling, $480; public buildings, $100 (?). MANAGEMENT.—City Clk. and Supt., Eugene Whiting; Pump. Engrs., Ed. Savill and R. L. Benson. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan 10, '85.

23. **CARBON HILL,** Grundy Co. (Not given.) Built in '93 by village; put in operation Jan. 1, '94. Contrs., A. Wilson & Co. SUPPLY.—Artesian well, 1,900 ft. deep, flowing direct through mains, surplus water runs into reservoirs for fire protection. Water is supplied at seven public taps only. A local coal Co. receives a large amount of surplus water and in return furnishes high pressure service in case of fire. RESERVOIR.—Two large fire wells and basin. FISCAL YEAR CLOSED Apr. 30. DISTRIBU-

TION.—Mains, 1 mile. Taps, 7. Hydrants, public, 28. PRESSURE.—Ordinary, 80 lbs.; fire, 130 lbs. Steam fire engines are used. FINANCIAL.—Cost, $7,000. Expenses: Operating, $150. MANAGEMENT.—Prest., A. Wilson; Vill. Clk., R. Fleming; Treas., F. Kodat. Rept. by Vill. Clk. SEWERS.—None.

24. **CARLINVILLE,** Macoupin Co. (3,293.) Built in '89-90 by Carlinville Water Co. FRANCHISE.—30 yrs. from Dec. 7, '88; provides for purchase of works by city 15 yrs. after date of franchise and at intervals of five yrs. thereafter. If not bought at end of 30 yrs., franchise becomes renewed. Rates are subject to regulation by city. Co. was exempt from local taxes for first five years. City receives water for schools, parks, etc., free. No legal difficulties. SUPPLY. — Macoupin Creek, pumping to stand-pipe and direct. Drainage area, 125 sq. miles. PUMP. — Cap., 1,500,000 galls.; Deane. Bituminous coal used; av. cost, 4 cts. per bushel. FILTERS. — American, 100,000 galls., and Jackson (Western?) filters. RESERVOIRS.—Impounding dam. STAND-PIPE.—Cap., 70,512 galls.; steel; 10 × 120 ft. DISTRIBUTION.—Mains, 7 miles. Taps, 278; made for $10. Services, paid for by owner. Use of meters optional with consumer. Hydrants, public, 68. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $75,000; all paid-up; paid no div'd in '95. Floating debt, $8,000. Expenses: Operating, $3,000 to $3,500; int., $1,800 semi-annually; taxes, $350. Revenue: Consumers, $4,800; City, fire protection, none; street sprinkling, $250. MANAGEMENT.—Prest., Wm. P. Dickinson, Chicago; Secy., Theo. Leohr, St. Louis, Mo.; Treas. and Supt., Geo. Seigel; Ch. Pump. Engr., Alfred Seigel. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary and storm sewers.

25. **CARLYLE,** Clinton Co. (1,784.) Bought by city July 12, '94; built in '87 by Carlyle Water, Light & Power Co. Press repts. state city and Co. were in litigation from completion to purchase; city claimed deficient pressure and refused to pay hydrant rental; also that city paid $26,000 for works, which in '87 cost $30,000. SUPPLY.—Kaskaskia River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane. STAND-PIPE.—Cap., 70,000 galls.; steel; 10 × 110 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 100; made by city. Services, galv. i.; paid for by consumer. Meters: 2; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for county buildings. Hydrants, public, 43. PRESSURE.—Ordinary, 60 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $35,000. Expenses: Operating, $1,000. Rept. by F. P. Bacon, June 1, '96. SEWERS.—Has sanitary and storm sewers.

26. **CARMI,** White Co. (2,785.) Built in '94-5 by city. Engr. and Contr., Geo. C. Morgan, New York Life Bldg., Chicago. SUPPLY.—Little Wabash River, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; two Deane dup. (rept. by makers as installed in '94.) STAND-PIPE.—Cap., 98,000 galls.; 12 × 116 ft. FINANCIAL.—Cost, $28,000 (?). NOTE.—Rept. from Engr. just after beginning construction, supplemented by press rept. that works were completed.

27. **CARROLLTON,** Greene Co. (2,258.) Built in '90 by city; put in operation in Dec. SUPPLY.—Deep wells, pumping to storage reservoir and repumping to stand-pipe and direct. PUMPS.—A 1,250,000-gall. Deane dup.; also (?) deep-well. Bituminous coal used. RESERVOIR.—Cap., 68,000 galls.; storage. STAND-PIPE.—Cap., 27,000 galls. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by city appropriations. Taps, 182; made by consumer. Services, lead; paid for by property owner. Meters: 7; owned, controlled and repaired by city. Use of meters compulsory for mills, stables, jails and court-house. City can compel use of meters and any consumer may have one. Hydrants, public, 48; private, 120. CONSUMPTION.—(Galls.) av., 100,000; max., 125,000; min., 75,000. PRESSURE.—Ordinary, 58 lbs.; fire, 175 lbs. FINANCIAL.—Cost, $44,000. Bonded debt, $15,000, at 5, due $1,000, yearly. Revenue, $1,015: Consumers, unmetered, $550; metered, $200; street sprinkling, $140; sewer flushing, $125. Deficits are met by annual tax levy. MANAGEMENT.—Chn. Comrs., E. L. Davis; Ch. Pump. Engr., Sam'l Brown. Rept. by Chn., June 16, '96. PROJECTED IMPROVEMENTS.—Works are to be run in connection with present electric light plant. SEWERS. —None.

28. **CARTHAGE,** Hancock Co. (1,654.) Built in '87 by town. SUPPLY.—Artesian well, 1,800 ft. deep; pumping from receiving reservoir to tank and direct. PUMPS.—Cap., 500,000 galls.; Knowles dup. RESERVOIR.—Cap., 60,000 galls. TANK.—Cap., 61,770 galls.; wood, 20 x 24 ft., on trestle 80 ft. high. FISCAL YEAR CLOSED July 1. DISTRIBUTION. — Mains, 2 miles; cost extensions met by taxation. Taps, 75. Services, ¾-in. galv. i.; paid for by property owner. Meters: 55; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 40. PRESSURE.—Ordinary, 70 lbs.; fire, 160 lbs. FINANCIAL.—(In '90.) Cost, $15,300. Bonded debt, $12,300 at 6%, due in annual payments of $1,000. Expenses, $1,413. Operating, $675; int., $738. Revenue, Consumers, $309. MANAGEMENT.—Rept. by Chn., A. N. Cherrill, June 5, '96. SEWERS.—Has sanitary sewers only.

29. **CENTRALIA,** Marion Co. (4,763.) Built in '94 by city. Des. Engr., Isaac A. Smith, St. Louis. Contr., Edmund T. Sykes, Minneapolis. SUPPLY.—By pumping. PUMPS.—Cap., 2,460,000 galls.; two Deane comp. dup. (rept. by makers). FINANCIAL. —Contract price, $35,483. NOTE.—Subject to revision.

P 3. **CERRO GORDO,** Platt Co. (939.) Bids for works were to have been re-

ceived by town June 15, '96, but up to Aug. 5, '96, contracts had not been let. Dec., '96, citizen rept. project would revive. Des. Engr. (?), C. F. Sturtevant, St. Louis. Vill. Clk., E. A. Barnwell.

30. **CHADWICK,** Carroll Co. (Est., 320.) Built in '95 by village; put in operation July 1. Engrs. and Contrs., Fairbanks, Morse & Co. SUPPLY.—Well, pumping to tank. PUMPS. — From Contrs. Gasoline used. TANK. — Wood; on brick tower. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 1 mile. Taps, 12; made by consumer for $8.50. Services paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 5. FINANCIAL.—Cost, $8,000. Bonded debt, $3,000, at 6%; due $500, each year. Expenses, Operating, $250. MANAGEMENT.—Prest., C. M. Kungery; Treas., Louis Imel; Supt., and Ch. Pump. Engr., Fred Duehl. Rept. by E. M. Humbert, June 19, '96. SEWERS.—None.

31. **CHAMPAIGN AND URBANA,** Champaign Co. (Champaign, 5,839; Urbana, 3,511.) Built in '85 by Union Water Supply Co. FRANCHISE.—30 yrs. from '85 for Champaign and 15 yrs. for Urbana; provides for purchase of works by city every 5 yrs. Rates are subject to regulation of city. Co. is not exempt from local taxes. City to pay for hydrant rental. No legal difficulties. SUPPLY.—Seven deep wells, pumping to reservoir and direct. PUMPS.—Cook and Deane deep well. Bituminous pea coal used; av. cost $1 per short ton. RESERVOIR.—Cap., 300,000 galls.; distributing. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 31¼ miles; cost extensions met by Co. Taps, 1,400; made by Co. for $3 to $4. Services, iron; paid for by consumer. Meters: 300; owned and repaired by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 200. CONSUMPTION. — (Galls.) av., 750,000; max., 960,000; min., 550,000. PRESSURE.—Ordinary, 35 lbs.; fire, 120 lbs. Steam fire engines are only used in exceptional cases. FINANCIAL.—Cap. Stock, authorized, $50,000; all paid-up. Bonded debt, $100,000, at 6%; due '99. Expenses, int., $6,000; taxes, $600. Revenue, City, fire protection, $6,007. MANAGEMENT.—Prest., M. A. Goff. Rept. by Secy. and Supt., Jno. N. Beers, June 5, '96. PROJECTED IMPROVEMENTS.—Additional wells. SEWERS.—Under construction. REFERENCE.—Eng. News, Mar. 27, '86.

32. **CHARLESTON,** Coles Co. (4,135.) Built in '76 by city. SUPPLY.—Embarras River, pumping direct. River is 134 ft. below, and 3 miles from city. PUMPS.—Cap., 2,430,000 (?) galls.; 1,200,000 Dean double crank, previously rept.; makers rept. 1,230,000 Deane (Hoyoke) comp. dup. added in '92; also 2,000,000 Dean (Indianapolis) comp. dup. pump being furnished in Nov., '96. DISTRIBUTION.—(In '87.) Mains, 10 miles. Hydrants, 35. FINANCIAL.—(In '87.) Cost, $40,000. Bonded debt, $21,000, at 10%. Expenses, $5,400: Operating, $3,300; int., $2,100. Revenue, $3,500. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 6, '88.

— ? **CHATSWORTH,** Livingston Co. (827.) Built in '93 by city; tested in Dec. Contrs. (wholly or in part), U. S. Wind Engine & Pump Co., Batavia, Ill., and (?) Fairbanks, Morse Co., Chicago. SUPPLY.—Open well, pumping to tank. PUMPS.—Originally 6 × 20-in. Curtis double-acting pump, driven by 18-ft. Halliday windmill. Makers rept. a Goulds pump, driven by gasoline engine. TANK.—Cap., 60,000 galls.; on 80-ft. wood tower. FINANCIAL.—First cost, $3,000.

33. **CHEBANSE,** Iroquois Co. (616.) Built in '76 by Chebanse Water-Works Co. SUPPLY.—Source not given (probably well), pumping to tank. PUMP.—Wind engine. TANK.—Cap., 30,000 galls. DISTRIBUTION.—(In '88.) Mains, 1,500 ft. Taps, 20. Meters, 0. Hydrants, 16. FINANCIAL.—(In '88.) Cost, $3,500. Cap. Stock, $3,500. No debt. Expenses, $50. NOTE.—No rept. since '90-1 Manual.

34. **CHENOA,** McLean Co. (1,226.) Built in '95-6 by city; put in operation Jan. 15. Engr., Geo. C. Morgan, Chicago. SUPPLY.—Two driven wells, 135 ft. and 214 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 100,000 galls.; two Goulds, driven by gasoline engine. Gasoline used; av. cost, 10 cts. per gall. STAND-PIPE.—Cap., 50,000 galls.; steel; on brick tower, 130 ft. high. DISTRIBUTION.—Mains, 5 miles. Taps, 41; made by city for $10. Services, lead; paid for by consumer. Hydrants, public, 53. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $21,000. Bonded debt, $7,000, at 6%; due 20 yrs. MANAGEMENT.—Prest., C. F. Churchill. Rept. by Fritz Ramsdorf, June 19, '96. SEWERS.—Has sanitary and storm sewers.

35, 36, 37. **CHICAGO,** Cook Co. (1,099,850 + territory annexed since '90.) First supplied in '40 by Chicago Hydraulic Co. City built works '51-4. Since May, '89, area of city has been increased by annexation from 43.8 to 187.1 sq. miles. Six of the annexed municipalities had water-works built as follows: Hyde Park and Lake, each in '74; Lake View, '75-6; Pullman, '80-2; Norwood Park, Rogers Park and Washington Heights, each in '89. Hyde Park, Lake, Lake View and Pullman were annexed to city in '89, Pullman being included in one of the other municipalities; Washington Heights was annexed in '90; Norwood Park and Rogers Park in '93. The works at Pullman and Rogers Park were built and are still owned and operated by private companies, as described separately below. All the other plants are included in city works.

SUPPLY.—Lake Michigan, pumping direct; also artesian wells for former Washington Heights and Norwood Park plants, pumping to tank and stand-pipe, respectively.

TUNNELS.—Total dy. cap., 484,000,000 galls. Lake View: 6 ft. diam., 6,000 ft. long, supplying Lake View pumping station. Chicago Ave. Lake: two; one 5 ft., 10,560 ft. long; one 7 ft., 10,560 ft. long; both supplying North pumping station. Chicago Av. Land: 7 ft.; length 20,856 ft., under city from 7 ft. Lake tunnel to west side pumping station. Four Mile: 8 ft. for 9,139 ft. and remainder split into two 6-ft. tunnels of a combined length of 25,200 ft. This tunnel also extends on land to 14th St. pumping station, and is 8 ft. for 516 ft. and 6 ft. for 2,320 ft.; it also extends to Central pumping station, and is for that part 7 ft. dia. for 7,053 ft. and 6 ft. for 480 ft. 68th St. tunnels: 7 ft. dia. for 5,037 ft. and 5 ft. dia. for 8,030 ft. There is also a 6-ft. branch, to submerged crib, 5,026 ft. long. PUMPS.—Cap., 358,500,000 galls. Lake View, 31,500,000: 12,000,000 and 13,500,000 Holly-Gaskill hor. high duty; 5,000,000 Worthington comp. cond.; balance uncertain, but makers rept. 2,000,000 Holly quadruplex as in reserve; there was also a 2,000,000 Vergennes previousy rept. North Side, 99,000,000: 2—12,000,000 Holly Gaskill hor. high duty; 36,000,000, 18,000,000, 12,000,000 and 8,000,000 cond. beam previously rept. would account for all but 1,000,000 of total cap. Central, 36,000,000: 2—15,000,000 Allis; (see just below). 14th St., 54,000,000: 3—15,000,000 Allis; possibly the Allis pumps at this and last-named station are now rated at 18,000,000 each, though 15,000,000 were contracted for and previously rept. West Side, 60,000,000: 4—15,000,000 comp. cond. beam. 68th St. (formerly Hyde Park), 77,000,000: 12,000,000 Worthington; 4—12,000,000 Holly-Gaskill hor. high duty; 2—4,000,000 Holly vert. (rept. by makers as in reserve); 2—3,000,000 Gordon & Maxwell; 3,000,000 Knowles. Washington Heights (in '90), 700,000, besides which there was a 430,000 deep well pump. Norwood Park (in '89), 300,000; Deane dup. Av. cost of fuel used: Anthracite coal, $4.94 per short ton; bituminous coal, $2.64 per short ton; fuel, oil; $1.49 per 100 galls. RESERVOIR.—Cap., 60,000 galls.: receiving, at Washington Heights. TANKS.—Washington Heights: About (in '90) 115 ft. above pump. (Press rept. Sept., '96, stated this tank had failed and that its cap. was 60,000 galls.) Norwood Park: Cap., 30,000 galls.; wood, about 12 × 36 ft., on 66-ft. brick tower. STAND-PIPES.—(In '89.) At North and West Side pumping stations, 3 × 188 ft., and 5 × 167 ft., respectively, each enclosed in masonry towers. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 1,615 miles, including 3 miles of wood pipe in Norwood Park; cost of over one-third of mains laid in '95 met by special assessment. Taps, 283,792; made by city for $11.73 (av.). Services paid for by property owner. Meters: 5,120; owned by consumers (and city?); controlled and repaired by city, latter at consumer's expense; yearly rental, (?) none. Hydrants, public, 16,466; fire cisterns, 98. CONSUMPTION.—(Galls.) av., 251,839,816; max., 291,323,581 (Feb. 9); min., 217,707,258. (Nov. 9.) PRESSURE.—Ordinary, 30 lbs. Steam fire engines are used. FINANCIAL.—Cost, $23,933,880. Debt, $4,426,500: Floating, $200,500; Bonded, $4,226,000 at av. of 3.77%; $9,000 at 7%, due in '96; $132,000 at 6%, due $50,000 in '97 and $82,000 in '98; $178,000 at 5%, due $15,000 yearly from '96 to 1902, inclusive, and $78,000 in 1904; $3,241,000 at 4%, due $50,000 in 1907, $150,000 in '08, $159,500 in '10, $821,000 in '12, $576,000 in '14 and $1,485,000 in '15; $332,000 at 3.65%, due in 1902; $333,500 at 3½%, due $225,000 in 1909 and $108,500 in '10. Expenses, Operating, $1,435,516. Revenue, $3,168,594: Consumers, unmetered, $2,070,619; metered, $1,004,203; other purposes, $93,772. MANAGEMENT.—Comr. Pub. Wks., Jos. Downey; City Engr., Lewis B. Jackson; Asst. City Engr., John Ericson; Supt. Water Bureau, J. C. Craig. PROJECTED IMPROVEMENTS.—New tunnels under construction to supply two new pumping stations with dy. cap. of 60,000,000 galls. each. Press rept., Jan., '97, stated contracts for three Worthington pumps for each of these stations, and for one Holly or Gaskill pump for Lake View station had just been awarded. In Feb., '97, Saml. Artingstall, Cy. Engr., Lyman E. Cooley, Geo. H. Benzenberg, Milwaukee, Wm. Sooy Smith and Jos. Downey, Comr. Pub. Wks., recommended diversion of sewage from lake and extension of all tunnels to 4-mile point, provisions for future extensions to 50 ft. of water. REFERENCES.—Engineering News; General: Mar. 26, '81; Nov. 22, '84; Apr. 21, '92; May 11, '93. Hyde Park tunnel and inlet crib: Jan. 12, '89; July 26, '94, illus.; May 31, '94, illus. and inset. Pumping engines: May 31, '90; Aug. 24, 93; Sept. 20, '94; May 30, '95. Tunnels: July 5, 26, '90; Sept. 8, 15, 22, '92, illus. Contrivance for removing anchor ice at intake, June 27, '91; typhoid fever, Feb. 27, Apr. 21, May 12, '92; consumption, Oct. 27, '92; sanitary condition, Nov. 2, 93; stand-pipe accident, Apr. 25, '95. Works of former town of Lake, Apr. 8, '82.

PULLMAN PLANT.

Built in '80-2 by Pullman Palace Car Co., to supply its town. SUPPLY.—Hyde Park division of Chicago Water-Works, through meters, pumping direct and to elevated tank. TANK.—Cap., 500,000 galls.; 56 × 81 ft., on tower 200 ft. high, for fire protection only. DISTRIBUTION.—Mains, 15 miles. Taps, 700; made by city. Services, iron or lead; paid for by Pullman Co. Meters: 50; owned, controlled and repairs paid by Pullman Co. Use of meters optional with consumer; compulsory for all factories and shops. Hydrants, public, 130. PRESSURE.—Fire, 75 lbs. One steam fire engine is used. FINANCIAL.—Cost, $180,000. No debt. Revenue, City, fire protection, $10,000. MANAGEMENT.—Prest., Geo. M. Pullman; Treas., Duane Doty, C. E. Kept. by Treas., July 11, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, June 27, '85; tower, Jan. 12, '93, illus.

ROGERS PARK WATER CO.

FRANCHISE.—30 yrs. from '89. No legal difficulties. SUPPLY.—Lake Michigan, pumping to stand-pipe and direct. Intake, 16-in., 1,200 ft. long. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane comp. dup. Bituminous Indiana block coal used; av. cost, $3 per short ton. FILTERS.—Cap., 750,000 galls. (maker rept. 400,000); American (New York). STAND-PIPE.—Cap., 105,000 galls.; steel; 12 × 125 feet. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.— Mains, 17 miles; cost extensions met by surplus. Taps, 615; made by Co. free. Services, lead; paid for by consumer. Meters: 125; owned by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 165. CONSUMPTION.—(Galls.) av., 350,000; max., 1,000,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—(In '90.) Cost (in '88), $70,000. Cap. Stock: authorized, $50,000; all paid up. Bonded debt, $57,000 at 6%. Expenses, $5,820: Operating, $2,400; int., $3,420. Revenue, City, $5,675. MANAGEMENT.—Prest. and Supt., H. E. Keeler; Secy., Chas. Howard; Treas., N. A. Partridge, all of Chicago. Rept. by Prest., July 24, '96. SEWERS.—Has sanitary and storm sewers.

38. **CHICAGO HEIGHTS,** Cook Co. (Not given.) Built in '94 by village; put in operation Dec. 24. Engr., W. B. Ewing, La Grange. Contrs., Seckner Contracting Co., Chicago. SUPPLY.—Four 10-in. drilled wells, 200 ft. deep, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Smith-Valle dup. Illinois bituminous coal used; av. cost, $1.52 per short ton. STAND-PIPE.—Cap., 180,000 galls.; 16 × 120 ft. FISCAL YEAR CLOSED Apr. 27, '96. DISTRIBUTION.—Mains, 8 miles; manner of meeting cost extensions is under consideration. Taps, 175; made by village tapper who receives $1.25 per tap; village charges $5 for furnishing materials. Services, lead; paid for by consumer. Meters: 5; owned by consumer; controlled by village, repaired under village supervision. Use of meters optional with consumer; compulsory for manufacturers. Hydrants, public, 72; private, about, 8. CONSUMPTION.—(Galls.) av., 200,000; max., 450,000; min., 80,000. PRESSURE.—Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $59,000. Bonded debt, $59,000: $14,000, at 6%; due in 20 yrs. from date of completion; $45,000, at 6%, due in 10 yrs. and paid in 10 installments by special taxation. Expenses: Operating, $2,028; int., $420. Revenue: Consumers, unmetered, $1,112; metered, $120. MANAGEMENT.—Prest., G. C. Flanner; Secy., P. F. Jirtle; Treas., O. A. Oswald; Supt., Geo. H. Fuller; Ch. Pump. Engr., H. W. Royce. Rept. by Secy., Dec. 29, '96.

39. **CHILLICOTHE,** Peoria Co. (1,632.) Built in '91 by Chillicothe Water, Electric Light & Power Co.; put in operation Oct. 10. Engr., J. S. Daily. Contrs., Municipal Construction Co., Peoria. SUPPLY.—Driven wells, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Smedley dup. comp. DISTRIBUTION.—Mains, 4½ miles. Taps, 279. Services, galv. i. Meters, 0. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 387,000. PRESSURE.—Ordinary, 50 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $47,000, including electric light plant. Cap. Stock: Authorized, $35,000; all paid-up. Surplus, $12,000. Bonded debt, $35,000, at 6%. Expenses: Operating, $3,273, including electric light plant. Revenue: Consumers, $1,975; City, fire protection, $1,938. MANAGEMENT.—Prest., Joseph Daily; Secy., D. R. Daily; Treas., J. S. Daily; Supt., J. F. Marquardt. Rept. by Treas., Jan. 18, '97. SEWERS.—None.

40. **CISSNA PARK,** Iroquois Co. (Est., 420.) Built in '94 by village. Engr., J. A. Haskett. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Flowing well, pumping from receiving reservoir to stand-pipe. PUMP.—Driven by 8-HP. gasoline engine (press rept.). Gasoline used for fuel. RESERVOIRS. — Impounding. TANK. — Cap., 47,000 galls.; 20 × 20 ft., on tower. DISTRIBUTION.—Mains, 2 miles; cost extensions met by special tax and licenses. Taps, 40; made for from $4 for ¾-in. to $8. Services, paid for by village to curb. Meters, 0. Hydrants, public, 18. PRESSURE.—Ordinary, 60 lbs.; fire, 65 lbs. FINANCIAL.—Contract price (press rept.), $7,490. Bonded debt, $4,500, at 6%. Deficits are met by taxation and sinking fund. MANAGEMENT.—Supt., Thos. Mell. Rept. by H. J. Kahney, Aug. 17, '96. SEWERS.—Tile drain for surface water.

41. **CLAYTON,** Adams Co. (1,033.) Built in '95 by A. Gruber, Thos. More, E. E. Smith and O. E. Bryant. FRANCHISE.—25 yrs. from '95. City to pay $200 per yr. for public service. SUPPLY.—Wells, pumping to tank. PUMPS.—Deane. TANK.—Cap., 11,500 galls.; wood; 14 × 10 ft., on wooden trestle 20 ft. sq. at base, 11 ft. sq. at top and 78 ft. high. FISCAL YEAR CLOSED in May. DISTRIBUTION.—Mains, 8 blocks. Services, galv. i. Meters, 0. Hydrants, public, 8; private, 1. PRESSURE.—Ordinary, 35 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $5,000. No floating debt. Revenue, City, fire protection, $200. MANAGEMENT.—Prest., A. Gruber. Rept. by Supt. and Ch. Pump. Engr., E. E. Smith, Jan. 7, '97. SEWERS.—Has storm sewers only.

42. **CLINTON,** De Witt Co. (2,598.) Built in '87-8 by city. SUPPLY.—Driven wells; 4—6-in. and 3—8-in., pumping to reservoirs and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Deane. Makers rept. air lift, with 10 × 14-in. Rand compressor. Bituminous coal used; av. cost, $1.52 per short ton. RESERVOIRS.—Cap., 1,750,000 galls.; 750,000 and 1,000,000. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains 8½ miles; cost extensions met by special assessments per foot. Taps, 635; made by consumer. Services, lead; paid for by consumer. Meters: 7; owned and repaired by consumer; controlled by city. Use of meters compulsory for R. R. shops and barns. City can

compel use of meters and any consumer may have one. Hydrants, public, 83; private, 2. CONSUMPTION.—(Galls.) av., 257,000; max., 280,000; min., 125,000. PRESSURE.—Ordinary, 40 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $55,000. Debt, $24,000: Floating, $12,000, at 5%; Bonded, $12,000, at 5%; due 1907. Sinking Fund, none. Expenses: Operating, $8,297. Revenue, $4,051: Consumers, unmetered, $1,893; metered, $1,827; street sprinkling, $100; public buildings, $500; other purposes, $231. Deficits are met by general taxation. MANAGEMENT.—Supt., J. E. Moffett; Ch. Pump. Engr., Chas. Dickinson. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary and storm sewers.

F 4. **COAL CITY**, Grundy Co. (1,672.) Built in '96 by village for fire protection. Supply, reservoir, lifted by Knowles pump. Mains, 1¼ miles. Rept. by Fire Marshall, Wharrie, Oct. 2, '96.

D 1. **COATSBURG**, Adams Co. (308.) Built in '94 by village for domestic use. Supply, deep well, pumping to tank. (Press rept. states windmill is used.) Cost, $1,000. Com., Jno. Kramer. Rept. by C. A. Murrah, Oct. 28, '96.

43. **COLLINSVILLE**, Madison Co. (3,498.) Built in '92-3 by city. Engr., Prof. J. B. Johnson, Washington Univ., St. Louis, Mo. SUPPLY.—Two artesian wells, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Snow comp. dup., and dup. high-pressure. Slack and pea coal used. RESERVOIR.—Cap., 80,000 galls. STAND-PIPE.—Cap., 75,000 galls.; iron, 10 × 120 ft. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by property owners. Taps, 50; made by city for $8. Services, galv. i.; paid for by consumer. Meters: 50; owned by consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) max, 40,000. PRESSURE.—Ordinary and fire, 53 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $12,400, at 5%; due $1,000 each year after '98. Sinking Fund, none. Expenses, Operating, $750; int., $520. Revenue, Consumers, metered, $560; street sprinkling, $240. MANAGEMENT.—Rept. by Chn. W.-W. Comrs., Dr. J. L. R. Wadsworth, Oct. 24, '96. SEWERS.—None.

—? **CRESCENT CITY**, Iroquois Co. (Crescent Township, 1,002.) Built in '90 by town. Contrs., U. S. Wind Engine & Pump Co., Batavia. SUPPLY.—Four wells, pumping to tank. PUMP.—Driven by Halladay windmill on top of tank. DISTRIBUTION.—Mains, 5 blocks. Hydrants, 5. FINANCIAL.—Cost, $2,800. NOTE.—Rept. by Contrs., for works as built in '90.

44. **DALTON CITY**, Moultrie Co. (334.) Built in '96 by village; put in operation May 1. Engr., J. A. Haskett, Kansas City, Mo. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Dug well, pumping to tank. PUMP.—22½-ft. windmill on 100-ft. steel trestle, operating a 5 × 16-in. direct-acting pump. TANK.—Cap., 58,200 galls.; cypress, 24 × 21 ft., on brick tower, 70 ft. high. DISTRIBUTION.—Mains, 1¼ miles. Taps, 45. Meters, 0. Hydrants, public, 17. FINANCIAL.—Cost, $8,000. MANAGEMENT.—Prest., Chas. Dalton; Chn. of Com. on Fire and Water and Supt. A. Claussen. Rept. by Prest., Dec., '96.

—? **DANFORTH**, Iroquois Co. (Township, 1,644.) Built in '91 by village; put in operation June 15. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Eureka. TANK.—Cap., 28,800 galls. FINANCIAL.—Cost, $2,700. Bonded debt, $1,500, at 6%. MANAGEMENT.—Rept. by Prest., Jno. Overacker, Sept. 24, '96. NOTE.—Above information is from '90 Manual. Prest. writes, "no improvements since the water gave out; we are drilling a new 8-in. well, have reached the depth of 1,200 ft., but no water has been found." NOTE.—Contrs. for above, U. S. Wind Engine & Pump Co., Batavia.

—? **DANVERS**, McLean Co. (506.) Rept. in '92 that contracts had been let by town for pump, 20 × 24-ft. tank on 50-ft. brick tower and mains. Dec., '96, citizen rept. town had works.

45. **DANVILLE**, Vermilion Co. (11,491.) Built in '82-3 by Danville Water Co. FRANCHISE.—30 yrs. LEGAL DIFFICULTIES.—(Press rept.) City refused to pay more than $1,900 of the $2,621 due under contract for second quarter in '95. City claimed franchise invalid. Lower court decided in favor of Co., Mar., '96, and city appealed. SUPPLY.—North Fork of Vermilion River and Clear Lake, pumping to stand-pipe and direct. Dam built across river in '95. PUMPS.—Two Blake, with aggregate cap. of 4,000,000 galls. (In '89); makers rept. 3,000,000 Barr pump placed on old Blake end. STAND-PIPE.—Cap., 14,000 galls.; 3½ × 200 ft., with brick casing for 100 ft., above which it is double riveted. DISTRIBUTION.—Mains, 21 miles. Taps, 1,350. Meters, 100. Hydrants, public, 158. CONSUMPTION.—(Galls.) av., 1,300,000. PRESSURE.—Ordinary, 70 lbs.; fire, 85 lbs. FINANCIAL.—(In '88.) Cost, $250,000. Cap. Stock, $200,000. Bonded debt, $150,000, at 7%. MANAGEMENT.—Prest., Geo. R. Long; Vice-Prest., A. F. Callahan; Secy. and Treas., Wm. Lockett; all of Louisville, Ky.; Supt., G. B. Sidelinger. REFERENCE.—Eng. News, May 17, '84.

46. **DECATUR**, Macon Co. (16,841.) Built in '71 by town. SUPPLY.—Sangamon River, through filter crib, pumping direct. PUMPS.—Cap., 3,000,000 galls., Allis. (Makers rept. Hughes pump here.) FILTER CRIB.—(In '89.) 10 × 600 ft. by 6 ft. high, arched over. FILTERS.—Cap., 3,000,000 galls.; Warren (rept. by makers). DISTRIBUTION.—Mains, 15 miles. Taps, 819. Meters, 8. Hydrants, 157. CONSUMPTION.—(Galls.) av., 2,000,000. FINANCIAL.—Bonded debt, $35,000. Expenses: Operating, $8,500; int., $3,500. NOTE.—No official rept. since '90-1 Manual. REFERENCES.—Eng. News, Dec. 17, '81; Warren filters, Jan. 4, '94, illus.

47. **DE KALB**, De Kalb Co. (2,579.) Original plant built in '74 by city, now abandoned. Present works built in '95 by city; put in operation in Feb. Engr., D. W. Mead, Rockford. Contrs., Gould Co., Chicago. SUPPLY.—Deep well, 14 ins. in diam. and 900 ft. deep, pumping to storage well and repumping to stand-pipe and direct. PUMPS.—Cap., 1,982,000 galls.; Downie deep well and 2—750,000 Goulds triplex, all run by electric power furnished by De Kalb Electric Light Co. under 10-yrs. contract. City pays 4 cts. per 1,000 galls pumped, for power. Water measured by Venturi meter. RESERVOIR.—Cap., 500,000 galls.; storage well. STAND-PIPE.—Cap., 200,000 galls.; 20 × 85 ft. DISTRIBUTION.—Mains, 13 miles; cost extensions met by revenue. Taps, 550. Services, ⅝-in. lead; paid for by city to sidewalk. Meters, 50. Use of meters optional with consumer. Hydrants, public, 112. CONSUMPTION.—(Galls.) av., 113,000. PRESSURE.—Ordinary, 40 lbs.; fire, 98 to 125 lbs. FINANCIAL.—Cost, $102,828. Bonded debt, $15,000, at 5%; due: $1,000 in '99 and $2,000 each yr., 1900 to 1906. Expenses: Operating, about, $2,500; int., $750. Revenue: Consumers, $4,110; street sprinkling, $60. MANAGEMENT.—Comrs. Chn., Dr. J. M. Everett. Rept. by City Clk., E. A. Porter, June 6, '96. SEWERS.—Has sewers. REFERENCES.—Eng. News, May 13, '82; Pohle air lift pumps, July 12, '94, illus.; Downie electric pumping plant, Sept. 26, Oct. 3, '95, illus.; deep wells and municipal ownership, Oct. 3, '95, illus.

—? **DELAVAN**, Tazewell Co. (1,176.) Contrs., U. S. Wind Engine & Pump Co., Batavia, and (?) Fairbanks, Morse & Co., Chicago.

48. **DES PLAINES**, Cook Co. (986.) Built in '95-6 by village; put in operation in Sept. SUPPLY.—Well, 8 ins. × 200 ft., pumping (to stand-pipe?). FINANCIAL.—Est. cost, $30,000. NOTE.—Subject to revision.

49. **DIXON**, Lee Co. (5,161.) Owned by Dixon Water Co.; built in '84 by A. H. McNeal and S. S. Murphy, Burlington, N. J.; afterwards sold to Co. FRANCHISE.—30 yrs. from '83; provides for purchase of works by city after 20 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Three artesian wells, 1,640 ft., 1,738 ft. and 1,810 ft. deep, flowing into reservoir at pumping station, thence pumped to stand-pipe. PUMPS.—Cap., 2,000,000 galls. Gordon & Maxwell. Bituminous small lump coal used; av. cost, $1.75 to $2 per short ton delivered. RESERVOIR.—Cap., 500,000 galls.; receiving, located at pumping station. TANK.—Cap., 270,000 galls.; iron, 40 × 30 ft., on high bluff. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 11½ miles; cost extensions met by Co. Taps made by Co. at $3.50 for taps and $2.30 for lead connection. Services, galv. i.; paid for by consumer. Meters: 10; owned by consumer; controlled by Co. Use of meters optional with Co. Hydrants, public, 100; private, 9; street stand-pipes, 8. CONSUMPTION.—(Galls.) av., 700,000; max., 1,000,000; min., 600,000. PRESSURE.—Ordinary, 60 lbs.; fire, 200 lbs. if necessary. FINANCIAL.—Cost, $140,000. Cap. Stock: Authorized, $60,000; all paid-up. Bonded debt, $60,000, at 6%; due 1915. Expenses, Operating, $4,500. Revenue, City, fire protection, $7,000; street sprinkling, $300; MANAGEMENT.—Prest., John D. Crabtree; Secy. and Treas., James A. Hawley; Supt., John Wasley. Rept. by Secy., June 15, '96. SEWERS.—Has partial system of sanitary sewers.

—? **DOLTON** (P. O. Dolton Station), Cook Co. (Dolton Station, 1,110.) Rept. by Fairbanks, Morse & Co., Chicago, as having water supply.

50. **DOWNER'S GROVE**, Dupage Co. (960.) Built in '94 by village; put in operation in Oct. Engrs., Alvord & Shields, The Rookery, Chicago. SUPPLY.—2—10-in. deep wells, pumping to receiving reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 1,864,000 galls.; 2—432,000 Hooker deep well and 1,000,000 Laidlaw-Dunn-Gordon. Bituminous mine run coal used; av. cost, $1.90 per short ton. RESERVOIR.—Cap., 75,000 galls.; receiving, 27 × 17 ft. STAND-PIPE.—Cap., 135,000 galls.; steel; 16 × 95 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by special assessment. Taps, 220; made by village for $12, including service to curb. Services, lead, ¾-in.; paid for by consumer. Meters: 3; owned and repaired by consumer; controlled by village. Use of meters compulsory for green houses, livery stables and steam users. Village can compel use of meters and any consumer may have one. Hydrants, public, 70; private, 1. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 60 lbs., fire, 100 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $20,000, at 5%; due 1914. Expenses: Operating, $1,600. No deficits since erection. MANAGEMENT.—Prest., C. V. Carpenter; Secy., Bert C. White; Treas., Warren Rogers. Rept. by Supt. and Pump. Engr., J. D. Fowler, June 20, '96. PROJECTED IMPROVEMENTS.—Air-lift pump and about 2 miles of mains. SEWERS.—None.

51. **DUNDEE**, Kane Co. (Est., 2,023.) Built in '95 by village; put in operation May 1. Engr., D. W. Mead; Contrs., Rockford Construction Co.; all of Rockford. SUPPLY.—Springs, 55 ft. above pumping station, by gravity to reservoir, thence pumping to stand-pipe and direct, ordinarily with ram, and in very dry weather with triplex pumps operated by Otto gasoline engines. PUMPS.—Cap., 1,060,000 galls.; 2—500,000 Deming triplex, driven by 2—36-HP. Otto gas engines; 60,000 8-in. hydraulic ram. RESERVOIR.—Cap., 300,000 galls.; storage, about ⅛ mile from pumping station. TANK.—Cap., 100,000 galls.; steel; 20 × 40 ft., on steel 8-post trestle 30 ft. high. Tank is connected with mains through Dousman automatic valve, which cuts off tank pressure when fire pressure is put on mains. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 5½ miles. Taps, 150; made by village to within 6 ft. of property

line, at $10 for ⅝-in., $11 for ¾-in., $13 for 1-in. Services, extra strong lead; paid for by consumer. Meters: 6; owned by consumer; controlled and repaired by village. Use of meters compulsory for large school, printing office, livery, etc.; village can compel use of meters and any consumer may have one. Hydrants, public, 86. CONSUMPTION.—(Galls.) av., 50,000; max., 100,000; min., 5,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $25,000, at 6%; due in 8 equal yearly payments. Expenses: Operating, $800. Revenue: Consumers, unmetered, $600; metered, $100; street sprinkling, $50. MANAGEMENT.—Trustees. Prest., J. W. Herrick; Clk., Theo. W. Luther. Rept. by Supt. and Ch. Pump. Engr., L. J. Schroder, June 30, '96. SEWERS.—None. REFERENCE.—Gasoline pumps, Eng. News, May 28, '96, illus. and inset.

P 4. **DUQUOIN,** Perry Co. (4,052.) Works under construction in Feb., '97; election proposed.

52. **DWIGHT,** Livingston Co. (1,854.) Built in '91 by city (press rept.). SUPPLY.—By pumping. PUMPS.—Cap., 1,000,000 galls.; two Deane dup. (report by makers).

53. **EARLVILLE,** La Salle Co. (1,058.) Built in '95 by city; put in operation Dec. 13. Engr., N. E. Stucker, Ottawa. Contrs., Campbell & Dennis, Joliet. SUPPLY.—10-in. well, pumping to collecting reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 800,000 galls.; 800,000 Gardner and 375,000 deep well. RESERVOIR.—Cap., 43,000 galls.; collecting. STAND-PIPE.—Cap., 84,600 galls.; steel, 12 × 100 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4,400 ft. Taps, 30; made by city free to those who pay $10 rental per tap. Services, lead extra strong; paid for by consumer. Use of meters optional with city. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 19,000. PRESSURE.—Ordinary, 47 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $14,696. Bonded debt, $7,500: $3,000, at 5%; due 1902; $2,500 at 5%, due 1903; $2,000 at 5%, due 1904. Sinking Fund: $833, not invested. Deficits are met by taxation. MANAGEMENT.—Ch. Pump. Engr., Wm. H. Norton. Rept. by H. V. Chase, Cy. Clk, June 20, '96. SEWERS.—Has storm sewers.

54. **EAST DUBUQUE,** Jo Daviess Co. (1,069.) First works built in '83 by city; new works put in operation Dec. 1, '94. Contrs., Dubuque Constn. Co. SUPPLY.—Artesian well, pumping to stand-pipe and direct. PUMP.—Cap., 750,000 galls.; Worthington comp. non-cond. Minonk bituminous coal used; av. cost, $2.40 per short ton. RESERVOIR.—Cap., 68,000 galls.; for fire protection only. STAND-PIPE.—Cap., 72,000 galls.; steel, 12 × 85 ft., on hill. DISTRIBUTION.—Mains, 5 miles; cost extensions met by taxation. Taps, 75; made by city for $2.50. Services, lead; paid for by consumer. Meters: 2; owned and repaired by consumer; controlled by city. Use of meters compulsory for bottling works and printing office. City can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $30,000. MANAGEMENT.—Rept. by Engr., Jno. Lobstern, Oct. 9, '96.

55. **EAST ST. LOUIS,** Saint Clair Co. (15,169.) Now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. Built in '86 by City Water Co. FRANCHISE.—20 yrs.; provided for purchase of works by city in '95 and at intervals of 5 yrs.; price to be determined by arbitration. SUPPLY.—Mississippi River, pumping to settling reservoir and stand-pipe for low service and direct for high service. PUMPS.—Cap., 19,000,000 galls.; 2—8,000,000 Worthington, a comp.cond. and non-comp. high pressure; two Holly-Gaskill hor. high duty, 8,000,000 and 5,000,000, latter for high service. RESERVOIR.—Cap., 7,500,000 galls.; low service, settling about 24 ft. above river; in two compartments. STAND-PIPE.—Cap., 132,500 galls.; 15 × 100 ft. DISTRIBUTION.—Mains, 40 miles. Hydrants, public, 230. PRESSURE.—Ordinary, 50 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Pres., W. S. Kuhn, Pittsburg, Pa.; Secy. and Treas., J. H. Purdy; Supt., F. M. Horner. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96.

—? **EDWARDSVILLE,** Madison Co. (3,561.) Press rept., Mar. 4, '97, stated ordinance had been introduced in city council granting 30-yr. franchise to F. Wm. Raeder, St. Louis, for works to be built in accordance with plans previously adopted by council. Hydrants, 80, at yearly rental of $4,200. Est. cost, $75,000. Bryon & Humphrey, St. Louis, rept. late in '96 that they had done considerable preliminary work for plant here.

56. **EFFINGHAM,** Effingham Co. (3,260.) Built in '96 by Effingham Water-Works Co.; put in operation Apr. 18. Contrs., Brownell Improvement Co. FRANCHISE.—20 yrs. from '96. "City has option of purchase first." Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay (press rept.) $35 each per yr. for 100 hydrants. No legal difficulties. SUPPLY.—Little Wabash River, pumping to stand-pipe. PUMPS., Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon. Bituminous lump coal used; av. cost, $1.60 per short ton. FILTERS.—Gravel and charcoal. STAND-PIPE.—Cap., 180,000 galls.; iron; 16 × 126 ft., on stone foundation. DISTRIBUTION.—Mains, 14 miles; cost extensions met by city. Taps, 63; made by consumer for $6. Services, lead and galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 99.

CONSUMPTION.—(Galls.) av., 100,000; max., 85,000; min., 40,000. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $79,000. Revenue: Consumers, $850; City, fire protection, $3,500. MANAGEMENT.—Prest., Jos. Partridge; Secy and Treas., H. B. Wernsing; Supt., Henry Alt; Ch. Pump. Engr., S. A. Johnson. Rept. by Supt., Feb. 8, '97. SEWERS.—Has storm sewers only.

57. **ELGIN,** Kane Co. (17,823.) Built in '87-8 by city. SUPPLY.—Fox River, pumping to stand-pipe. PUMPS.—Cap., 9,000,000 galls.: 2—1,500,000 Worthington comp. cond.; 6,000,000 Holly-Gaskill hor. high-duty. Illinois bituminous coal used; av. cost, $2 per short ton. FILTERS.—Cap., 2,000,000 (makers rept. 4,000,000) galls.; American (New York) and New York. STAND-PIPE.—Cap., 510,000 galls.; steel; 80 × 115 ft., on 20-ft. concrete and stone foundation. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 39¼ miles; cost extensions met by revenue. Taps, 2,408; made by city at $11.50 for ⅝-in., $13.50 for ¾-in., and $17.50 for 1-in., including service to curb. Services, lead; paid for by consumer. Meters: 200; owner, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 337; private, 15. CONSUMPTION.—(Galls.) av., 1,000,000; max., 3,000,000; min., 700,440. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $210,700. Bonded debt, $118,000, at 5%; due, $3,000, July, '97. Expenses: Operating, $3,500; int., $5,900. Revenue, Consumers, unmetered, $17,389; metered, $7,988. MANAGEMENT.—Prest., C. W. Raymond; Secy., J. L. Foot. Rept. by Supt., R. R. Parkins, June 9, '96. PROJECTED IMPROVEMENTS.—New filter. SEWERS.—None.

58. **ELMHURST,** Dupage Co. (1,050.) Built in '90-1 by Elmhurst Spring Water Co.; put in operation July 1. FRANCHISE.—30 yrs. SUPPLY.—Mammoth Spring, pumping to water tower. Spring is 3¼ miles from town. PUMPS.—Cap., 700,000 galls.; Worthington. TANK.—Cap., 30,000 galls.; 100 ft. high. DISTRIBUTION.—Mains, 9 miles. Meters: 170; owned by consumer or Co.; yearly rental $2, where consumer does not wish to buy; adopted meter system July, '95. FINANCIAL.—Cost, $35,000. Cap. Stock: Authorized, $50,000; all paid-up. Bonded debt, $20,000. MANAGEMENT.—Prest., W. H. Emery. Rept. by Secy., Jno. T. Emery, Sept. 28, '96.

59. **ELMWOOD,** Peoria Co. (1,548.) Built in '96 by city; put in operation May 1. Engr., C. F. Sturtevant, Bushnell. Contr., B. O. Krotter, Knoxville. SUPPLY.—Artesian well, pumping to storage reservoir, and repumping direct. PUMPS.—Cap., 850,000 (?) galls.; 150,000 Cook single acting (deep-well?); 850,000 Deane dup. Bituminous nut coal used; av. cost, 75 cents per short ton. RESERVOIR.—Cap., 50,000 galls.; storage. DISTRIBUTION.—Mains, 3¼ miles. Taps, 65; made by consumer, fee of $6.50 to city. Services, galv. i.; paid for by consumer. Meters: 1; owned and repairs paid by consumer; controlled by city. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 15,000; max., 30,000; min., 8,000. PRESSURE.—Ordinary, 35 lbs.; fire, 60 lbs. FINANCIAL.—Bonded debt, $9,000 at 6%; due in 5 to 20 yrs. Expenses, Operating, about $1,200. MANAGEMENT.—Prest., John Clinch; Secy., Z. L. Gilbert; Treas., Wm. Christy; Supt., J. H. Graham. Rept. by Prest., Jan. 5, '97. SEWERS.—None.

60. **EL PASO,** Woodford Co. (1,353.) Built in '82 by city. SUPPLY.—Well, 10 × 60 ft., with 3-in. wells sunk 54 ft. in bottom, pumping to tank and direct. PUMP.—Cap., 90,000 galls.; Smith & Valle dup., operated by wind power; lifts water 58 ft. TANK.—Cap., 36,100 galls.; wood; 16 × 24 ft., on timber trestle. DISTRIBUTION.—(In '87.) Mains, 2.5 miles. Taps, 35. Meters, 0. Hydrants, 20. PRESSURE.—(In '87.) Ordinary, 40 lbs.; fire, 65 lbs. FINANCIAL.—(In '87.) Cost, $12,000. No debt. Expenses: Operating, $50. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, July 14, '88.

61. **EUREKA,** Woodford Co. (1,481.) Built in '86 by village. SUPPLY.—Well, 12 × 60 ft., pumping to tank and direct. PUMPS.—Cap., 260,000 galls.; Worthington. TANK.—Cap., 36,100 galls.; 16 × 24 ft., on brick tower 60 ft. high. FISCAL YEAR CLOSED May 31. DISTRIBUTION.—Mains, 0.8 miles. Taps, 40. Hydrants, public, 9. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—(In '88.) Ordinary, 40 lbs. FINANCIAL.—Cost, $6,500. Bonded debt, $5,000, at 6%. Expenses, $650: Operating, $300; int., $300; repairs, $50. Revenue: Consumers, $325. MANAGEMENT.—Chn., G. W. Hootman. Rept. by City Clk., Roy L. Moore, Sept. 24, '96.

62. **EVANSTON,** Cook Co. (12,762.) Built in '74 by town. Supplies Wilmette. South Evanston, which built village works in '84, was annexed to city Feb. 20, '96; its pumping plant has been abandoned. SUPPLY.—Lake Michigan, pumping direct. PUMPS.—Cap., 24,000,000 galls.: 5,000,000 and 12,000,000 Holly-Gaskill hor. high duty (latter added in '96); 2,000,000 Holly quadruplex (rept. by makers). Bituminous mine run coal used; av. cost, $3.65 per short ton. FISCAL YEAR CLOSED March 31, '94. DISTRIBUTION.—Mains, 48 miles. Taps, 2,450. Meters, 0. Hydrants, public, 368. CONSUMPTION.—(Galls.) av., 2,993,296, excluding water sold to Wilmette. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $399,100. Expenses, $15,693: Operating, $12,308; int., $3,385. Revenue, $37,149: Consumers, unmetered, $35,558; metered, $1,591. NOTE.—No official rept. since '94. REFERENCE.—Eng. News, Dec. 24, '81; water waste; Jan. 25, '94; anchor ice at intakes, Jan. 17, '95. South Evanston plant, Eng. News, Feb. 2, '85.

63. **FAIRBURY,** Livingston Co. (2,324.) Built in '87 by village. SUPPLY.—Source not given, pumping to tank. In '91 village voted to issue $15,000 of bonds for

artesian wells and extension of mains. PUMPS.—Cap., 57,600 galls. TANK.—Cap., 60,000 galls.; 75 ft. high. DISTRIBUTION.—(In '88.) Mains, 1 mile. Taps, 18. Meters, 0. Hydrants, 12. CONSUMPTION.—(Galls.) av., 1,500. PRESSURE.—(In '88.) Ordinary, 75 to 175 lbs. FINANCIAL.—(In '88.) Cost, $8,000. Bonded debt, $5,000, at 6%. NOTE.—No rept. since '90-1 Manual.

64. **FARMER CITY,** Dewitt Co. (1,367.) Built about '94 by city. Contr., Geo. C. Morgan, New York Life Bldg., Chicago. SUPPLY.—Well, pumping to tank and direct. PUMP.—Downie deep-well. TANK.—Cap., 40,000 galls.; 12 x 48 ft., on brick tower 68 ft. high. NOTE.—Information from Contr. and press repts.

65. **FARMINGTON,** Fulton Co. (1,375.) Built in '94 by city; put in operation in June. Engr., Chas. F. Sturtevant, St. Louis, Mo. SUPPLY.—Artesian well, pumping to collecting reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 575,000 galls.; Hooker deep-well and 575,000-gall. Deane dup. Steam is furnished from electric light plant for $500 per yr. STAND-PIPE.—Cap., 52,800 galls.; steel; 10 x 90 ft. FISCAL YEAR CLOSED in May. DISTRIBUTION.—Mains, 2 miles. Taps, 55; made by city for $3. Services, galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 85,000; max., 50,000. PRESSURE.—Ordinary, 42 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $11,000, at 6%, due 10 to 20 yrs. Sinking Fund, none. Expenses, Operating, $600. Revenue, Consumers, $400. MANAGEMENT.—Prest., Jackson Muson; Secy., S. P. Wood; Treas., Lloyd Marsh; Supt., Chas. A. Smith. Rept. by J. W. Connelly, Oct. 24, '96. SEWERS.—None.

66. **FLANAGAN,** Livingston Co. (884.) Built in '90 by village; put in operation Oct. 1. Engrs. and Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Artesian well, pumping to collecting reservoir and repumping to tank. PUMPS.—One steam and one hot air. Anthracite coal used; av. cost, $6.50 per short ton, used for hot air and bituminous at $2.75, for steam. RESERVOIR.—Cap., 20,000 galls. TANK.—Cap., 36,000 galls.; wood, on brick foundation. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by general fund. Taps, 50; made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., summer, about 25,000; winter, 15,000. PRESSURE.—Ordinary and fire, 30 lbs. FINANCIAL.—Cost, $10,000. No debt. Expenses, Operating, $1,000. Revenue, City, fire protection, about $250. MANAGEMENT.—Prest., Chas. W. Zehren; Secy., A. F. Mette; Treas., C. C. Studly; Ch. Pump. Engr., E. A. Meyers. Rept. by D. Whalen, Dec. 15, '96. SEWERS.—Has sanitary and storm sewers.

—? **FORREST,** Livingston Co. (1,021). Built in '95 by village. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—Pumping to tank. PUMP.—Goulds, 8 x 10-in.; driven by gasoline engine (rept. by maker of pump). TANK.—Cap., 45,000 galls. MANAGEMENT.—Prest. Vill. Bd., J. R. Ives.

67. **FORRESTON,** Ogle Co. (1,118.) Built in '94 by village; put in operation in Dec. Engrs., Fairbanks, Morse & Co., Chicago. Contrs., U. S. Wind Engine & Pump Co., Batavia. SUPPLY.—Well, 300 ft. deep, pumping to tank. PUMPS.—Two Goulds, operated by 5½-HP. gasoline engine. Gasoline used. TANK.—Cap., 60,000 galls.; wood; 21 x 24 ft. on round brick tower, base 24 ft. diam., top, 18 ft. diam. and 75 high; total height, 104 ft. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, about 1½ miles; cost extensions met by tax levy on all property. Taps, 32; made by village for $9, including service to sidewalk. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 5,000. PRESSURE.—Ordinary, 52 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $6,000, at 6%: Due $1,000 yearly from '97 to 1902, inclusive. Expenses, Operating, about $75; int., $360. Revenue, Consumers, unmetered, $210. MANAGEMENT.—Prest., M. D. Storer; Secy., H. H. Fuasman; Treas., Lewis De Graff; Ch. Pump. Engr., Elias Bardole. Rept. by Secy., Dec. 30, '96. SEWERS.—None.

F 5. **FRANKFORT STATION,** Will Co. (431.) Built in '94-5 by village; put in operation Feb. 1. Contrs., Fairbanks, Morse & Co., Chicago. Supply, source not given; lifted by windmill and pump to elevated tank. Tank, cap., 42,000 galls.; pine; 16 x 22 ft., on 4-column steel tower 50 ft. high. Mains, 4,000 ft. Taps, 0. Hydrants, public, 11. Cost, $5,000. Revenue, none. Supt., C. Eichenberg.

68. **FREEPORT,** Stephenson Co. (10,189.) Built in '82 by Freeport Water Co. FRANCHISE.—30 years from '82; provides for purchase of works by city at end of franchise. Rates are not fixed in franchise nor subject to regulation by city. Co is not exempt from local taxes. City to pay for all public service, which is included in hydrant rental. LEGAL DIFFICULTIES.—"Some differences with city, not at present settled." SUPPLY.—22 wells, 38 to 200 ft. in depth, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 1,750,000 comp. cond. and 1,250,000 non-cond. Knowles hor. Illinois bituminous nut and pea coal used; av. cost, $1.65 per short ton. STAND-PIPE.—Cap., 115,000 galls.; 15 x 35 ft., iron, on ground 107 ft. above river and 178 ft. above center of city. FISCAL YEAR CLOSED Dec 31, '95. DISTRIBUTION.—Mains, 19.4 miles; cost extensions met by current revenues. Taps, 1,204; made by Co. Services, lead and galv. i.; paid for by consumer. Meters, 344; owned by Co. and consumers; controlled and repaired by Co; yearly rental, $3. Use of meters compulsory for breweries and motors. Co. cannot compel and may prohibit use of meters by con-

sumers. Hydrants, public, 124; private, 3. CONSUMPTION.—(Galls.) av., 787,498; max., 1,216,600; min., 487,480. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $307,425. Cap. Stock: Authorized, $150,000; all paid-up; paid 1½% semi-annual div'd in '95. Bonded debt, $129,000, at 6%; due 1912. MANAGEMENT.—Prest., M. Stoskopf; Secy., H. B. Zartman; Treas., O. B. Bidwell; Ch. Pump. Engr., Chas. Lorenz. Rept. by Supt., Owen T. Smith, June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 20, '83.

F 6. **FULTON,** Whiteside Co. (2,099.) Built in '87 by village for fire protection. Supply, well, pumping to reservoir and direct. Pump, cap., 600,000 galls.; Deane. Reservoir, cap., 100,000 galls.

69. **GALENA,** Jo Daviess Co. (5,635.) Built in '86-7 by Galena Water Co. Contrs., Coler, Lamb & Co. FRANCHISE.—Provides for purchase of works by city at end of 10 yrs. Co. is not exempt from local taxes. SUPPLY.—Artesian well, 8 in. × 1,520 ft., pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 (in '89) galls.; two Smedley comp. cond. Bituminous nut and pea coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 129,250 galls.; 20 × 55 ft. FISCAL YEAR CLOSED Sept., '95. DISTRIBUTION.—Taps, 275; made by consumer, no fee. Services, iron and lead; paid for by consumer. Meters, 18; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for livery and factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 72. PRESSURE.—Ordinary, 85 lbs.; fire, 140 lbs. FINANCIAL.—Cost (in '88), $75,000. Cap. Stock (in '88): Authorized, $65,000; all paid-up. Bonded debt, $65,000. MANAGEMENT.—Prest., R Barrett; Treas., W. N. Coler, Jr., New York. Ch. Pump. Engr., J. Brickler. Rept. by Secy. and Supt., G. R. Melvill, Sept. 24, '96.

70. **GALESBURGH,** Knox Co. (15,264.) First supplied in '83 by Galesburgh Water Co.; unofficially rept. that city bought works in '91. Present works built in '90-1 by city; put in operation in '91. SUPPLY.—76 tubular and two artesian wells, pumping to reservoir and direct. PUMP.—Cap., 750,000 (?) galls.; Holly-Gaskill hor. single. Makers rept. 2—1,500,000 Holly-Gaskill rotative and 2,000,000 Worthington comp. non-cond. RESERVOIR.—Cap., 4,500,000 galls.; storage. DISTRIBUTION.—Services, galv. i.; paid for by consumer. Meters, 600; owned by consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 251. CONSUMPTION.—(Galls.) av., 789,811. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $200,000. Expenses: Operating, $5,057. MANAGEMENT.—Supt., M. J. Blanding; Ch. Pump. Engr., H. E. Wheeler. Rept. by Supt., '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 29, '84. NOTE.—Press rept., Mar., '97, stated large new air compressor had been received, and intimated one was already in use, each apparently for air-lifts.

71. **GALVA,** Henry Co. (2,409.) Built in '94 by village; put in operation Nov. 15. Engr., Geo. C. Morgan, Chicago. No contr. SUPPLY.—Well, pumping to collecting reservoir and re-pumping to stand-pipe and direct. PUMPS.—A 144,000-gall. Downie deep-well and 850,000 Deane. Bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 86,000 galls. TANK.—Cap., 37,000 galls.; steel; 11 × 48 ft., on masonry tower 68 ft. high. FISCAL YEAR CLOSED Jan. 31, '96. DISTRIBUTION.—Mains, 5¾ miles; cost extensions met by general taxation. Taps, 251; made by village. Services, galv. i.; paid for by village. Meters, 3; owned and repairs paid by consumer; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 68. CONSUMPTION.—(Galls.) av., 75,000 galls. PRESSURE.—Ordinary, 48 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $36,000. Floating debt, $17,000. Expenses: Operating, $2,500. Revenue: Consumers, unmetered, about $1,800; metered, about $115. Excess of operating expenses are met by general taxation. MANAGEMENT.—Supt., C. V. Dickinson; Ch. Pump. Engr., P. H. Johnson. Rept. by Supt., Jan. 11, '97. SEWERS.—None.

72. **GENESEO,** Henry Co. (3,182.) Built in '79-82 by city. SUPPLY.—Artesian wells, pumping direct from collecting reservoir. PUMPS.—Cap., 250,000 galls.; two Walker and Dayton deep-well. RESERVOIR.—Cap., 50,000 galls. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains (in '88), 8 miles. Taps, 110. Hydrants, public, 90. PRESSURE.—(In '89.) Ordinary 20 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $20,000. No debt. Expenses, $2,500. Revenue, $600. MANAGEMENT.—Rept. by City Clerk, J. F. Lieberknecht, Aug. 24, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Dec. 9, '82.

73. **GENEVA,** Kane Co. (1,692.) Built in '96 by city; put in operation in Oct. Engr., Geo. W. Sturtevant, Chicago. Contrs., Seckner Contracting Co., Chicago. SUPPLY.—Well, pumping to stand-pipe and direct from collecting reservoir. PUMP.—Cap., 1,500,000 galls.; Deane comp. dup. Makers also rept. 8½-HP. Otto gas engine furnished to drive pump here. Av. cost of coal used, $1.90 per short ton. RESERVOIRS.—Cap., 60,000 galls.; impounding. STAND-PIPE.—Cap., 110,000 galls.; steel, 16 × 100 ft. FISCAL YEAR CLOSED Dec. 31, '96. DISRTIBUTION.—Mains, 6 miles; cost extensions met by special assessments. Taps, 28; made by city. Services, lead; paid for by city. City can compel use of meters and any consumer may have one. Hydrants, public, 72. PRESSURE.—Ordinary, 60 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $36,000. Bonded debt,

$14,000. Sinking Fund, $600 is raised yearly. MANAGEMENT.—Rept. by Mayor, Irving L. Howell, Jan. 7, '97. SEWERS.—None.

P 5. **GENOA,** Dekalb Co. (634.) Village hopes to build in '97. Engrs., Hill & Enricht, Chicago. Supply, well, pumping to reservoir. Est. cost, $8,000. Rept. by Vill. Clk., A. U. Schneider, June 19, '96.

74. **GIBSON CITY,** Ford Co. (1,808.) Built in '95 by city. Engr., John A. Cole, Chicago. Contrs., W. H. & G. C. Wallingford, Newport, Ky. SUPPLY.—Three 8-in. wells, pumping to collecting reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 1,800,000 galls.; 575,000 comp. dup. and 1,225,000 dup. Deane. TANK.—40 ft. high, on stone tower 60 ft. high. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by special assessment. Taps, 100; made by city for $3. Use of meters optional with city. Hydrants, public, 32; private, 1. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $30,000. Rept. by C. S. Crary, July 18, '96.

P 6. **GILMAN,** Iroquois Co. (1,112.) City proposes to build works. Supply, artesian well, pumping to stand-pipe. Est. cost, $25,000. Unsigned rept., Oct. 14, '96. Rept. earlier that A. D. Thompson, Peoria, has designed works.

75. **GLENCOE,** Cook Co. (569.) Built in '94 by village. Engrs., Alvord & Shields, The Rookery, Chicago. DISTRIBUTION.—Mains, 16 miles. Hydrants, 128. NOTE.—Subject to revision.

76. **GRANITE, MADISON AND VENICE,** Madison Co. (Granite and Madison, not given; Venice, 932.) Supplied by Granite City, Madison & Venice Water Co. Venice first supplied in '89 by works built by village. In '92, Granite City & Madison Water Co. was incorp. by Wm. F., F. G. and Henry F. Niederhaus Co., to supply Granite City, a village built by them at or near the works of the St. Louis Stamping Co. Franchise was secured in '92 from village of Madison, and works were completed about July 1, '94. In '94 Co. bought Venice works for $16,000, $4,000 cash and balance in water to be furnished. Apr., '94, name changed to Granite City, Madison & Venice Water Co. SUPPLY.—Mississippi River, by pumping. PUMPS.—Cap., 5,000,000 (?) galls. FILTERS.—Special design by Supt. rept. as in use. FINANCIAL.—Cap. Stock, authorized, $500,000. MANAGEMENT.—Address F. G. Niederinghaus, Granite City. NOTE.—Information mostly from press repts. in '94.

—? **GRANT PARK,** Kankakee Co. (340.) Rept. as having works.

—? **GRAYVILLE,** White Co. (1,999.) Built in '95 by Geo. C. Morgan & Co.; put in operation Aug. 26. Combined water and electric light plant. FRANCHISE.—30 yrs. from '95. Co. is exempt from local taxes; works must run all night. City to pay $100 per light and $100 per hydrant if injunction is dissolved. LEGAL DIFFICULTIES.—City was enjoined from paying for works and the injunction made permanent. Works remain in hands of contractors. SUPPLY.—Big Wabash River, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; two Deane dup. STAND-PIPE.—Cap., 64,500 galls.; steel; 13 × 65 ft., on rock foundation. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 3 miles. Services, w. i.; paid for by consumer. Meters, 0; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 30. FINANCIAL.—Cost, $28,000. MANAGEMENT.—Prest., Treas. and Supt., Geo. C. Morgan, Chicago. Rept. Aug. 4, '96. SEWERS.—None.

P 7. **GREENUP,** Cumberland Co. (858.) June 25, '96, M. T. Monahan, Vill. Clk., rept. that village would build works, date unknown. Supply, Embarass River, pumping to stand-pipe. Est. cost, $10,000. Press rept., July 31, '96, stated $4,000 bonds had been voted, balance of cost to be raised by special assessment. Bids were to be received by village, Mar. 27, '97, for building works. Engr., D. W. Mead, Rockford.

—? **GREENVIEW,** Menard Co. (1,106.) Contrs., U. S. Wind Engine & Pump Co., Batavia, and Fairbanks, Morse & Co., Chicago.

77. **GREENVILLE,** Bond Co. (1,868.) Built in '84 by town. SUPPLY.—Well, 22 × 45 ft., pumping direct. PUMPS.—Cap., 42,000 galls.; 2—21,000 Blake pumps; only one pump used, except in case of fire. Bituminous slack used; av. cost, 50 cts. per short ton. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by revenue. Taps made by city for $1. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 20,000. Water is mostly used for sprinkling and stable purposes. PRESSURE.—Ordinary, 65 lbs.; fire, 120 lbs. FINANCIAL.—Cost (in '90), $24,000. Bonded debt, $13,000, at 5%. Expenses: Operating, $1,400. MANAGEMENT.—Rept. by Supt., A. Biggs, Aug. 18, '96. SEWER.—None. REFERENCE.—Eng. News, Oct. 31, '85.

P 8. **GROSSDALE,** Cook Co. (Not given.) Plans for works were made in '96 by Hill & Enricht, Chamber of Commerce Bldg., Chicago. Council passed $10,000 bond ordinance in Jan., '97, and bids were to be received Feb 23, '97. Feb. 13, '97, J. A. Hahn, Vill. Clk., rept. that "assessment was not confirmed by county court."

78. **HARVARD,** McHenry Co. (1,967.) Built in '92 by city. Contrs. (press rept.), Fairbanks, Morse & Co., Chicago. Rept. by Cy. Clk., P. E. Saunders, Aug. 29, '96.

79. **HARVEY,** Cook Co. (Not given.) Built in '91 by Harvey Transit Co.; put

in operation Jan. 1, '92. Engr., W. W. Reed. Contrs., Moffett, Hodgkins & Clarke. Chicago Title & Trust Co. appointed receiver Jan. 9, '95. FRANCHISE.—30 yrs. from '91; provides for purchase of works by city after 8 yrs. City to pay $4,000 per yr. for 127 fire hydrants. LEGAL DIFFICULTIES.—City claimed hydrant rental ($53) too high; settled by Co. accepting $4,000 per yr. SUPPLY.—Artesian well, 1,500 ft. deep, pumping to tank, to stand-pipe and direct. PUMPS.—Cap., 3,500,000 galls.; Worthington, 2,000,000 and 1,500,000. Illinois bituminous mine run coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 200,000 galls. STAND-PIPE.—Cap., 200,000 galls.; steel; 120 ft. high. TANK.—Cap., 80,000 galls.; wood; 80 ft. high. DISTRIBUTION.—Mains, 10.5 miles. Taps, 400; made by consumer for $2. Services, lead; paid for by consumer. Meters, 10; owned, controlled and repaired by Co. Use of meters optional with consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 127. CONSUMPTION.—(Galls.) av., 200,000; max., 250,000; min., 100,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $150,000. Bonded debt, $115,000, at 6%. Expenses, $6,000. Revenue: City, fire protection, $4,000; public buildings, free. MANAGEMENT.—Chicago Title & Trust Co., Receiver. Supt., W. J. McCorkindale. Ch. Pump. Engr., Wm. Kissell. Rept. by Supt., June 19, '96. PROJECTED IMPROVEMENTS.—New well, 1,650 ft. deep. SEWERS.—Has sanitary and storm sewers.

80. **HAVANA,** Mason Co. (2,525.) Built in '89-90 by city; put in operation Oct., '89. SUPPLY.—Ten 6-in. driven wells, 72 ft. deep, pumping to tank and direct. PUMPS.—Cap., 250,000 galls.; Dean comp. dup. Bituminous run of mine coal used; av. cost, $1.50 per short ton. TANK.—Cap., 20,000 galls.; iron; 15 × 36 ft., on brick tower 50 ft. high. DISTRIBUTION.—Mains, 10 miles; cost extensions met by appropriations. Taps, 500; made by city. Services, galv. i.; paid for by city to sidewalk. Meters, 0. Hydrants, public, 38. CONSUMPTION.—(Galls.) av., 400,000 galls.; max., 500,000; min., 300,000. PRESSURE.—Ordinary, 55 lbs.; fire, 120 lbs. FINANCIAL.—Floating debt, $2,000, at 6%. Expenses: Operating, $2,500. Revenue: Street sprinkling, $3,400. MANAGEMENT.—City Council. City Clk., Bernhard Walters; City Treas., Aug. C. Pfatzing; Rept. by Ch. Pump. Engr., Felix Priddy, Aug. 14, '96. SEWERS.—Has storm sewers only.

81. **HENNEPIN,** Putnam Co. (574.) Under construction in '96 by village. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—Artesian well, pumping to tank. TANK.—On 40-ft. steel tower. FINANCIAL.—Cost, about $20,000. MANAGEMENT.—Address Geo. Young. Rept. by Vill. Clk., Jno. W. Stauffer, Nov. 21, 96.

82. **HIGHLAND PARK,** Lake Co. (2,163.) Built in '94 by city; put in operation Mar. 10, '94. Engr., W. S. Shields, Chicago. Contr., W. F. Sturtevant, Minneapolis. SUPPLY.—Lake Michigan, pumping to stand-pipe. PUMPS.—Cap., 3,380,000 (?) galls.; 2—1,690,000 Dean comp. dup; also makers rept. 250,000 Worthington simple high pressure. Fuel oil used; av. cost, 2.04 cts. per gall. STAND-PIPE.—Cap., 150,400 galls.; 16 × 100 ft. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—Mains, 15 miles; cost extensions met by special assessment. Taps, 328; made by city, free. Meters, 286; owned, controlled and repaired by city; yearly rental, $4. Consumers are generally supplied through meters and the city can compel their use. Hydrants, public, 130. CONSUMPTION.—(Galls.) av., 119,790; max., 470,920 on Aug. 20; min., 74,976 on Mar. 13. PRESSURE.—Ordinary, 50 lbs.; fire, 70 lbs. FINANCIAL.—Contract price, about $55,000. MANAGEMENT.—Rept. by Supt. and Ch. Pump. Engr., Edw., Lang, Aug. 29, '96. SEWERS.—Has sanitary sewers only.

83. **HIGHWOOD,** Lake Co. (Not given.) Built in '95 by village. SUPPLY.—Highland Park Works, one mile distant. FINANCIAL.—Cost, est., $12,000. MANAGEMENT.—Rept. by Vill. Clk., July 6, '96, and from press repts.

84. **HILLSBORO,** Montgomery Co. (Est., 2,500.) Built in '88 by city. SUPPLY.—Springs, pumping to tank and direct PUMPS.—Cap., 500,000 galls.; Worthington. Bituminous slack used. FILTERS.—Cap., 500,000 galls. TANK.—Cap., 150,000 galls. DISTRIBUTION.—Mains, 2½ miles. Taps, 140. Services paid for by consumers. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 60 lbs.; fire, 180 lbs. FINANCIAL.—Cost, $17,000. Bonded debt, $12,000, at 6%. Expenses: Operating, $540. Revenue, $910. MANAGEMENT.—Comrs. Chn. L. A. Paden; Mayor, S. H. McLean; Cy. Clk., F. P. Winchester. Rept. by Ch. Pump. Engr., Richard Rowe, Feb. 1, '97, and Cy. Clk., Feb. 26, '97.

—? **HINCKLEY,** Dekalb Co. (496.) Makers rept. Goulds pump, driven by gasoline engine.

85. **HINSDALE,** Dupage Co. (1,584.) Built in '91 by village. SUPPLY.—Two artesian wells, pumping to tank. PUMPS.—Cap., 1,750,000 galls.: 750,000 Worthington simple high pressure; 1,000,000 Laidlaw-Dunn-Gordon. Oil used; av. cost, $2.23 per 100 galls., delivered. TANK.—Cap., 35,000 galls.; steel; 11 × 48 ft., on brick tower 68 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by special assessment. Taps, 300; made by village. Services, lead; paid for by property owners. Meters: 2; owned by consumer; controlled by village. Use of meters compulsory for green houses and laundries. Village can compel use of meters and any consumer may have one. Hydrants, public, 60. CONSUMPTION.—(Galls.)

av., 275,000; max., 600,000; min., 175,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $9,000, at 5%. Expenses: Operating, $3,000. Revenue: Consumers, $3,000. Deficits are met by general fund, account of fire protection. MANAGEMENT.—Rept. by Pres. of Vill., J. C. F. Merrill, July 14, '96.

86 **HOOPESTON,** Vermilion Co. (1,911.) Built in '88 by city; put in operation Nov. 1. Engr., G. C. Morgan, Chicago. SUPPLY.—Two 8-in. driven wells, pumping to collecting reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 1,360,000 galls.; 4—340,000 Deane. Bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 30,000 galls. STAND-PIPE.—Cap., 21,150 galls.; 10 × 36 ft., on brick tower 68 ft. high. DISTRIBUTION.—Mains, 16 miles; cost extensions met by revenue from water-works, and from fire and water fund. Taps, 450; made by city plumber for from 75 cts. to $4, according to size. Services, galv. iron; paid for by consumer. Meters, 50; owned, controlled and repaired by city. Use of meters optional with Co.; compulsory for hotels, lawn-sprinklers, restaurants, livery-stables, barns and factories. Hydrants, public, 30; private, 2. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80-100 lbs. FINANCIAL.—Cost, $60,000. Bonded debt, $8,000, at 5%, due in 1900. Expenses: Operating, $1,600. Revenue, $3,800: Street sprinkling, $50; public buildings, $50; other purposes, $3,700. MANAGEMENT.—Prest., H. L. Bushnell; Secy., C. E. Smith; Treas., D. D. Gilliman. Rept. by Ch. Pump. Engr., John Ernst, June 8, '96. SEWERS.—Has partial system of sanitary sewers.

—? **HOPEDALE,** Tazewell Co. (471.) Built in '88-9 by village for fire protection. Water pumped to 50,000-gall. tank. U. S. Wind Engine & Pump Co. rept. work done here and makers rept. Goulds pump, driven by gasoline engine; neither state when work was done.

87. **IPAVA,** Fulton Co. (667.) Built in '90 by Ipava Water Co. FRANCHISE.—10 yrs.; provides for purchase of works by city each year. SUPPLY.—Tube wells, 4½ ft. diam. and 1,550 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Barr comp. dup. TANK.—Cap., 42,300 galls.; 12 × 50 ft., on 50-ft. tower. DISTRIBUTION.—Mains, 1.8 miles. Services, galv. 1. Hydrants, 21. FINANCIAL.—Cost, $12,500. Cap. Stock, $5,690. Bonded debt: Co., $5,690; village, $5,000; total, $10,690. NOTE.—No rept. since '90-1 Manual.

88. **JACKSONVILLE,** Morgan Co. (12,935.) Built in '73-4 by city. SUPPLY.—Two artesian wells, one 3,028 ft. deep, both flowing, pumping. PUMPS.—Cap., 2,000,000 galls.; Worthington non-comp. high pressure. FISCAL YEAR CLOSED Jan. 1, '97. DISTRIBUTION.—Mains, 21 miles. Taps, 640. Meters, 421; owned by city and consumers. Hydrants, public, 147. FINANCIAL.—Expenses, operating, $9,686. Revenue, consumers, $11,280. MANAGEMENT.—Rept. by Supt., T. J. Bronson, and from annual rept. for '96. REFERENCE.—Eng. News, Oct. 15, '81.

89. **JERSEYVILLE,** Jersey Co. (3,207.) Built in '89 by city. SUPPLY.—Artesian well, 2,008 ft. deep; pumping to collecting reservoir and repumping to tank. PUMPS.—Cap., 750,000 galls.; Deane. There is also an air-lift. TANK.—135 ft. high. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 5 miles. Taps, 110. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 50,000. FINANCIAL.—Cost, $28,000. Bonded debt, $21,000, at 5%. Expenses, $3,050: Operating, $2,000; int., $1,050. MANAGEMENT.—Committee appointed by Mayor. Rept. by Mayor, H. A. Sheppard, Sept. 24, '96. REFERENCE.—Annulling of contract with Geo. C. Morgan by city, May 25, '89.

90. **JOLIET,** Will Co. (23,264.) Owned by city since '88; built in '80-1 by Joliet Water-Works Co. On completion of and test of works by Co., city claimed that franchise had not been complied with and revoked it. Then followed 7 yrs. of litigation, case going from lowest to highest courts and always being decided in favor of Co. In '88 city bought works at appraised valuation. SUPPLY.—Wells, pumping direct. There are 20 6-in. driven wells, 40 ft. deep; three artesian wells, 4, 5 and 6 ins. diam. and 1,200 ft. deep; one artesian well, 10 ins. diam. and 1,700 ft. deep. PUMPS.—Cap., 6,000,000 galls.: 3,000,000 Allis; 2—1,500,000 Holly-Gaskill hor. rotative. Makers rept. air lift, with 16 × 22-in. dup. Rand compressor. Bituminous lump coal used; av. cost, $1.80 per short ton. STAND-PIPE.—Cap., 41,900 galls.; 7 × 145 ft. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 25 miles; cost extensions met by special assessment. Taps, 1,489; made by city for $2. Services, ¾-in. lead; paid for by property owner. Meters: 34; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 150; private, 1. CONSUMPTION.—(Galls.) av., 2,000,000; max., 2,500,000; min., 1,500,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $275,000. Bonded debt of city, $165,200. Expenses: Operating, $13,000. Revenue: Consumers, $20,000. MANAGEMENT.—Mayor, E. C. Akin; Secy., Joshua Bell. Rept. by Supt., F. W. Dewey, June 5, '96. PROJECTED IMPROVEMENTS.—Enlargement of entire system will be submitted to people for vote before long. SEWERS.—Has partial systems of sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 18, '83.

91. **KANKAKEE,** Kankakee Co. (9,025.) Now controlled by Kankakee Water-Works Co. Built in '86-87 by Kankakee Water Co. FRANCHISE.—20 yrs. SUPPLY.—Kankakee River, pumping to stand-pipe; filtered. PUMP.—(In '89.) Cap., 3,000,000;

Gordon & Maxwell. STAND-PIPE.—Cap., 291,000 galls.; 20 x 124 ft.; failed Oct. 14, '86, before being filled. DISTRIBUTION.—Mains, 16 miles. Taps, 1,002. Meters, 6. Hydrants, public, 136. CONSUMPTION.—(Galls.) av., 850,000. PRESSURE.—(In '89.) Ordinary, 55 lbs.; fire, 100 lbs. FINANCIAL.—Cost (in '86), $160,000. Bonded debt (in '88), $125,000, at 6%. Expenses, $13,500: Operating, $5,000; int., $7,500. Revenue, $17,000: Consumers, $11,000; City, fire protection, $6,000. MANAGEMENT.—Prest., J. F. Moffett. Rept. by Supt., J. B. Reed, Oct. 30, '96. REFERENCES.—Stand-pipe accident, Eng. News, Oct. 30, '86, Oct. 6, '88, Mar. 16, '93, Apr. 19, '94, illus.

92. **KEITHSBURG,** Mercer Co. (1,484.) Built in '93 by city. Des. Engr., Chas. F. Sturtevant, St. Louis. SUPPLY.—By pumping. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane dup., one being comp. (rept. by makers). FINANCIAL—Cost, est., about $15,000 (in '93).

93. **KEMPTON,** Ford Co. (201.) Built in '95 by village; put in operation April 15 Engr., Jas. Kemp. SUPPLY.—Well, pumping to tank. PUMP.—Wind engine. TANK.—Cap., 24,255 galls.; on trestle 60 ft. high. DISTRIBUTION.—Mains; cost extensions met by taxation. Taps, 3. Services paid for by village. Use of meters not optional with village. Hydrants, public, 1. CONSUMPTION.—(Galls.) av., 500. PRESSURE.—Ordinary, 10 lbs.; fire, 38 lbs. FINANCIAL.—Cost, $2,000. Expenses: Operating, $72; int., $72. Deficits are met by taxation. MANAGEMENT.—Prest., J. W. Herron; Secy., Jas. Stuart. Rept. by Engr., Jas. Kemp, Nov. 26, '96. SEWERS.—None.

94. **KENILWORTH,** Cook Co. (Not given.) Built in '90 by Kenilworth Water Co. SUPPLY.—Lake Michigan, pumping to tank; filtered. PUMP.—Cap., 350,000 galls.; Deane. TANK.—Cap., 350,000 galls. DISTRIBUTION.—Mains, 3.5 miles. Taps, 90. Services, lead. PRESSURE.—Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $30,000. NOTE.—No rept. since '90-1 Manual.

95. **KEWANEE,** Henry Co. (4,569.) Built in '87-8 by village. SUPPLY.—Three non-flowing artesian wells sunk into St. Peter's sandstone, at depth of 1,480 ft., pumping to collecting reservoirs and repumping direct. PUMPS.—Cap., 1,500,000 galls.; Knowles, Downie, Cook, 1,000,000-Buffalo comp. and 500,000 high-pressure. Bituminous coal used; av. cost, $1.60 per short ton. RESERVOIRS.—Cap., 180,000 galls.; collecting: 150,000 and 30,000 galls. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 4 miles; cost extensions met by special assessment. Taps, 160; made by village for $12.50. Services, galv. i.; paid for by consumer. Meters: 160; owned, controlled and repaired by village. Use of meters compulsory for all consumers. Hydrants, public, 59; private, 12. CONSUMPTION.—(Galls.) av., 85,000; max., 350,000; min., 55,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost (in '90), $40,000. Bonded debt (in '90), $16,000 at 6%. Expenses, Operating, $3,000. Revenue, Consumers, unmetered, $27; metered, $1,500; City, fire protection, $2,950; street sprinkling, $160; sewer flushing, $100; public buildings, $20; public drinking fountains, $45. MANAGEMENT.—Rept. by Supt., Joseph Kean, June 6, '96. SEWERS.—Projected.

96. **KIRKWOOD,** Warren Co. (949.) Built in '96 by village. SUPPLY.—Deep well, pumping to stand-pipe. Supply insufficient. FINANCIAL.—Cost, about $8,000. MANAGEMENT.—Vill. Bd. Latest rept. from Vill. Clk., G. A. Baxter, Dec. 31, '96.

97. **KNOXVILLE,** Knox Co. (1,728.) Built in '96 by city; put in operation Mar. 20. Engr., Chas. F. Sturtevant, St. Louis, Mo. Contr., R. D. McCracken. SUPPLY.—Well, 1,350 ft. deep, pumping to collecting reservoir and repumping to stand-pipe direct. PUMPS.—Cap., 640,000 galls.: 420,000 Gardner dup.; 220,000 Downie deep-well. Bituminous coal used; av. cost, $1.85 per short ton. RESERVOIR.—Cap., 30,000 galls.; collecting, covered. STAND-PIPE.—Cap., 35,550 galls.; 11 x 50 ft., on brick tower 50 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4 miles. Taps, 51; made by city for $5. Services, galv. i.; paid for by consumer. Meters: 1; owned by consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one; compulsory for those using 300 galls. per day and upwards. Hydrants, public, 32; private, 6. CONSUMPTION.—(Galls.) av., 19,750; max., 23,000; min., 15,500. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $24,000. Bonded debt, $15,000, at 6%, due 1920. Expenses, int., $900. Deficits met by general taxation. MANAGEMENT.—Supt., W. Witherell; Ch. Pump. Engr., A. L. Warfel. Rept. by L. M. Smith, June 19, '96. SEWERS.—None.

98. **LACON,** Marshall Co. (1,649.) Built in '94 by city. Engr., J. A. Harman, Peoria. SUPPLY.—Well, pumping to stand-pipe and direct. PUMPS.—Cap., 1,575,000 galls.; 575,000 Deane comp. dup.; 1,000,000 Smedley; pumping is done by electric co. TANK.—Cap., 60,000 galls.; steel; 65 ft. high, on steel tower. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by special assessment. Taps, 200; made by consumer. Services, galv. i. Meters, 0. Hydrants, public, 60. CONSUMPTION.—(Galls.) av., 30,000; max., 100,000; min., 10,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $25,000. Expenses, Operating, $1,000. Works are self-supporting. MANAGEMENT.—Rept. by Supt., J. R. Chapman. SEWERS.—None.

—? **LADD,** Bureau Co. (Not given.) Built in '93 by city. Bonded debt (press rept. in '93), $5,000.

99. **LA GRANGE,** Cook Co. (2,314.) Owned by La Grange Light & Water-Works Co.; built in '90 by Moffett, Hodgkins & Clarke, Syracuse, N. Y.; put in operation Dec. 15. Present Co. rept. as incorp. in Apr., '92. Supplies La Grange Park. FRANCHISE.—30 yrs. SUPPLY.—Artesian wells, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 (?) galls.: 1,500,000 Worthington comp. non-cond.; 750,000 Deane comp. dup.; no others rept. STAND-PIPE.—Cap. 180,000 galls.; 16 × 120 ft. DISTRIBUTION.—Mains, 16 miles. Taps, 680. Hydrants, public, 121. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $180,000. Cap. Stock, $100,000. Revenue, City, fire protection, $4,530. MANAGEMENT.—Prest., J. F. Moffett, New York, N. Y. Rept. by Supt., J. M. Strasser, Sept. 26, '96.

100. **LA GRANGE PARK** (P. O. La Grange), Cook Co. (Not given.) Built in '95 by village; put in operation Dec., '95. Engrs., Ewing & Waite. Contrs., Iglehart Bros., Morgan Park. SUPPLY.—La Grange works, through meter, at 10¢. per 1,000 galls. DISTRIBUTION.—Mains, 3 miles; cost extensions met by special assessment in 10 installments. Taps, 100; made by consumer for $10. Services, lead. Village can compel use of meters and any consumer may have one. Hydrants, public, 36. PRESSURE.—Ordinary, 25 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $15,000. Rept. by Ewing & Waite, Aug. 28, '96. SEWERS.—Has sanitary and storm sewers.

101. **LA HARPE,** Hancock Co. (1,113.) Built in '96 by city; put in operation in Apr. Engrs. and Contrs., Howe Pump & Engine Co. SUPPLY.—Well, pumping to tank and direct. PUMPS.—Fairbanks, Morse & Co. gasoline engine and pump. TANK.—Cap., 12,000 galls. DISTRIBUTION.—Mains, 2 miles; cost extensions met by special assessments. Taps, 30; made for $5. Meters: 29; owned by city and consumers; controlled and repaired by city; yearly rental, $3. Use of meters compulsory for all consumers. Hydrants, public, 15. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $10,000. Floating debt, $7,000. Sinking Fund, $600. Expenses, Operating, $300; int., $360. Rept. by C. H. Ingraham, Mayor, Aug. 31, '96.

102. **LAKE FOREST,** Lake Co. (1,203.) Built in '91 by Lake Forest Water Co.; put in operation Oct. 1. FRANCHISE.—30 yrs. from '90; provides for purchase of works by city 15 yrs. after completion, and at end of each 5 yrs. thereafter, price to be determined by arbitration. Rates are not subject to regulation by city. Co. is exempt from local taxes for 20 yrs. Water furnished free for street sprinkling and two public drinking fountains; prices for other public services determined by contract, independent of franchise; present contract, $1,200 per yr. No legal difficulties. SUPPLY.—Lake Michigan, pumping to stand-pipe. PUMPS.—Cap., 2,550,000 galls.: 1,000,00 Gordon; 1,500,000 Deane dup. Bituminous coal used; av. cost, $2.50 per short ton. FILTERS.—Cap., 1,000,000 galls.; Jewell. STAND-PIPE.—Cap., 152,320 galls.; steel; 18 × 80 ft., on elevation, 135 ft. above Lake Michigan. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by rentals in advance. Taps, 170; made by Co. for $3. Services, iron; paid for by consumer. Meters: 14; owned and repaired by consumer; controlled by Co. Use of meters compulsory for clubhouses, university and large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 46. PRESSURE.—Ordinary, 25 to 100 lbs. FINANCIAL.—Cost $75,000. Cap. Stock: Authoried, $50,000; all paid-up. Bonded debt, $15,000, at 6%, due 1902. MANAGEMENT.—Prest., Edward F. Chapin, Secy., Jesse L. Moss; Treas., Edward F. Gorter; Ch. Pump. Engr., Jno. Foley. Rept. by Prest., June 27, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Jewell filters, Eng. News, May 28, '96.

F 7. **LANARK,** Carroll Co. (1,295.) Built in '88 by city. Direct pumping. Pump, a 1,000,000-gall. Smedley dup. Mains, ¾ mile. Hydrants, 12. Pressure, 45 to 150 lbs. No rept. since '89-90 Manual. A 60,000-gall. wood tank and substructure failed here. It was replaced in '94 by similar tank, on steel tower, by U. S. Wind Engine & Pump Co., Batavia.

103. **LA SALLE,** La Salle Co. (9,855.) Built in '88-9 by town. SUPPLY.—Springs and artesian wells, pumping direct. PUMPS.—Cap., 5,000,000 galls.: 2,000,000 Holly-Gaskill hor. high duty; 3,000,000 Worthington comp. non-cond. Bituminous slack used: av. cost, $1.75 per short ton, delivered. FISCAL YEAR CLOSED in April. DISTRIBUTION.—Mains, 17½ miles; cost extensions met by water-works fund. Taps, 904; made by city, ½-in. for $4, ¾-in. for $4.50 and 1-in. for $5. Services, lead and iron; paid for by property owner. Meters, 65; owned by property owner; controlled and repaired by city. Use of meters compulsory for manufacturers and liveries. City can compel use of meters and any consumer may have one. Hydrants, public, 98. CONSUMPTION.—(Galls.) av., 1,600,000; max., 1,800,000; min., 1,500,000. PRESSURE.—Ordinary, 100 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $131,888. Floating debt, $24,900, at 6%. Sinking Fund, $3,152. Expenses: Operating, $7,417; int., $1,614. Revenue: Consumers, unmetered, $7,584; metered, $2,700. MANAGEMENT.—Mayor, F. W. Matthiessen; Clk., A. C. Franklin. Rept. by Supt., Geo. A. Wilson, June 6. '96. SEWERS.—Has sanitary and storm sewers.

104. **LEMONT,** Cook Co. (Est., 6,000.) Built in '84 by village. SUPPLY.—Artesian wells, pumping to reservoir, with direct pumping from pond for fire protection. PUMPS.—Cap., 1,500,000 galls.; two Smith & Vaile. RESERVOIR.—Cap., 100,000 galls.; elev. 100 ft. DISTRIBUTION.—Mains, 4.5 miles. Taps, 215. Hydrants, public,

27. **PRESSURE.** — (In '87.) Ordinary, 45 lbs.; fire, 70 lbs. **FINANCIAL.** — Cost, $27,475. Bonded debt, $12,000, at 6%; due $2,000 per yr. after '93. Expenses, $2,820: Operating, $2,100; int., $720. Revenue: Consumers, $1,865. NOTE.—No rept. since '90-1 Manual.

105. **LENA,** Stephenson Co. (1,270.) Built in '96 by town, except last part of pipe-laying, which was to be done in '97. Contrs., U. S. Wind Engine & Pump Co., Batavia. SUPPLY.—Deep well, pumping to tank. PUMPS.—Cap., 215,000 galls.; Cook deep-well. TANK.—Cap., 57,000 galls.; wood; 20 × 24 ft., on 100-ft. masonry tower, which failed and was rebuilt. DISTRIBUTION.—Mains, 2 miles. FINANCIAL.—Cost, about $18,000. MANAGEMENT.—Rept. by Jno. F. Rife, Dec. 14, '96. SEWERS.—No sanitary sewers. REFERENCE.—Failure of water tower, Eng. News, Jan. 16, '93, Feb. 6, '96.

106. **LEROY,** McLean Co. (1,258.) Built in '92 by city; put in operation Jan., '93. Engr., James B. Clow & Sons, Chicago. SUPPLY.—One 8-in. tubular well, pumping to stand-pipe and direct. PUMP.—Cap., 580,000 galls.; deep-well, from Am. Well Wks., Aurora. Pumping done by electric light Co. STAND-PIPE.—Cap., 84,000 galls.; ⅛ to ¼-in.; steel; 12 × 100 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 200. Meters, 0. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 22,000. PRESSURE.—Ordinary, 30 lbs.; fire, 42 to 75 lbs. FINANCIAL.—Bonded debt, $3,000, at 5%. Expenses: Operating, $500, paid to electric light plant each year for pumping. MANAGEMENT.—Rept. by Wm. Jones, Jan. 16, '97. SEWERS.—No sanitary sewers.

107. **LEWISTON,** Fulton Co. (2,166.) Now owned by city; built in '88 by Lewiston Water Co., in which town had interest from the start. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Knowles. STAND-PIPE.—Cap., 25,000 galls.; 12 × 36 ft. DISTRIBUTION.—Mains, 5.8 miles. Taps, 165. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 80,000. FINANCIAL.—Cost, $32,000. Bonded debt, $31,000. Expenses: Int., $2,481. NOTE.—No rept. since '90-1 Manual.

108. **LEXINGTON,** McLean Co. (1,187.) Built in '95 by city; put in operation Feb. 11. Engr. and Contr., Geo. C. Morgan, Chicago, Ill. SUPPLY.—Well, pumping to stand-pipe. PUMPS.—Cap., 150,000 galls.; Cook deep-well. Bituminous coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 37,000 galls.; 11.5 × 48 ft., on brick tower 68 ft. high. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains: Cost extensions met by taxation. Taps, 48; made by city for $5. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 70,000. FINANCIAL. — Cost, $13,000. Debt, $17,000: Floating, $4,000, at 7%. Bonded, $13,000, at 6%; due $500 each year until paid. Expenses: Operating, $600. Revenue: Consumers, $850. MANAGEMENT.—Supt., A. H. Sorogan. Rept. by A. B. Davidson, June 19, '96.

109. **LINCOLN,** Logan Co. (6,725.) Built in '86 by Lincoln Water-Works Co.; now owned by Lincoln Water, Light & Power Co. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city at periods of 5 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $42.50 per hydrant per yr.; fountains and city buildings free. No legal difficulties. SUPPLY.—River, pumping to stand-pipe and direct. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Snow comp. dup. Bituminous slack used; av. cost, 55 cts. per short ton, delivered in bin. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Hydrants, public, 114. CONSUMPTION.—(Galls.) av., 1,000,000; max., 2,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $300,000. Cap. Stock: Authorized, $250,000; all paid-up; paid no div'd in '95. Bonded debt, $200,000, at 6%; due 1901. Expenses, $25,310. Revenue, $29,053. MANAGEMENT.—Prest., F. M. Mills; Secy. and Supt., A. H. Goode; Ch. Pump. Engr., Wm. Moore. Rept. by Supt., June 5, '96. PROJECTED IMPROVEMENTS.—New power house and new pumps; engines and boilers just completed. SEWERS.—Has sanitary and storm sewers.

110. **LITCHFIELD,** Montgomery Co. (5,811.) Built in '74 by town. SUPPLY.—Shoal Creek, pumping direct from impounding reservoir. Drainage area, about 20 square miles. PUMPS.—Cap., 4,250,000 (?) galls.: 500,000 Worthington; 750,000 Holly quadruplex (rept. by makers). RESERVOIR.—Formed by dam. Area, 24 acres. DISTRIBUTION.—Mains, 5.5 miles. Taps, 125. Hydrants, public, 53. CONSUMPTION.—(Galls.) av., 125,000. PRESSURE.—(In '89.) Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $85,000. Bonded debt: Unofficially rept. that original issue of $50,000 8% bonds were declared illegal by U. S. Supreme Court and that city refused to pay int. Expenses, $2,500. Revenue, $4,120; Consumers, $2,000; City, fire protection, $2,120. MANAGEMENT.—Comrs. SEWERS.—Has sewers. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 22, '82.

111, 112. **LOCKPORT,** Will Co. (2,449.)

LOCKPORT ARTESIAN WELL CO.

Built in '77. SUPPLY.—Artesian well, pumping to reservoir. PUMPS.—Cap., 140,000-gall. water-power. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 60. Hydrants, 20. FINANCIAL.—Cost, $5,000. Cap. Stock, $3,000. No debt. Expenses, $500. Revenue, $500. NOTE.—No rept. since '90-1 Manual.

MUNICIPAL WORKS.

Built in '95-6 by city. Const. Engrs., Alvord & Shields, The Rookery, Chicago. SUPPLY.—By pumping. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. NOTE.—Information from Engrs., pump makers and press rept.; subject to revision.

113. **MACOMB,** McDonough Co. (4,052.) Built in '94 by city; put in operation Jan. 1. Engr. and Contr., Geo. C. Morgan, Chicago. SUPPLY.—Well, 1,360 ft. deep, pumping to collecting reservoir and repumping to stand-pipe and direct. PUMPS.—A 192,000-gall. Downie deep-well and an 850,000 Deane dup. Bituminous coal used; av. cost, $2 per short ton. RESERVOIRS.—Cap., 85,000 galls.; collecting. STAND-PIPE.—Cap., 35,000 galls.; 11 x 48 ft., on brick tower 70 ft. high. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by appropriations from city funds. Taps, 300; made by city. Services, galv. i.; paid for by consumer. Meters: 1; owned by consumer; controlled by city. City can compel use of meters and any consumer may have one; compulsory for water motors. Hydrants, public, 62. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $30,000. Revenue, street sprinkling, $20 for each wagon. MANAGEMENT.—Rept. by Supt., W. E. Thompson, Sept. 12, '96. PROJECTED IMPROVEMENTS.—Well, lifting pump and force pump to be added in '97. SEWERS.—Has sanitary sewers only.

D 2. **MACON,** Macon Co. (819.) Built in '93 by city for domestic use. SUPPLY.—Well, pumping to tank. PUMPS.—Goulds (rept. by makers); driven by gasoline engine. TANK.—On 40-ft. tower.

— ? **MACKINAW,** Tazewell Co. (545.) Press rept., Apr., '96, stated pumping machinery and elevated tank were in place and that mains were being laid.

76. **MADISON,** Madison Co. See Granite.

P 9. **MANTENO,** Kankakee Co. (627.) Village has let contracts for works to J. K. Blatchford, Kankakee; funds not secured, but expect to begin construction May 1, '97. Engr., J. F. Schmeltzer, Manteno. Supply, deep well, pumping to reservoir. Est. cost, $14,000. Rept. by Chn. Com., S. Duquette, July 31, '97.

— ? **MAPLE PARK,** Kane Co. (382.) Built in '96 by village. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. Proposal advertisement, June, '95, called for pump, windmill, wooden tank or steel tower and pipe system. Contract price, $3,200.

114. **MARENGO,** McHenry Co. (1,445.) Built in '94 by city. Engr., Frank Sullivan, Marengo. Contrs., Seckner Construction Co., Unity Building, Chicago. SUPPLY.—Six driven wells, pumping to stand-pipe. STAND-PIPE.—Cap., 70,000 galls.; about 70 ft. high. DISTRIBUTION.—(Press rept. in '94.) Mains, 4 miles. Hydrants, about 45. FINANCIAL.—Cost, $12,000. MANAGEMENT.—Rept. by Supt., W. F. Corson, Oct. 27, '96.

115. **MAROA,** Macon Co. (1,164.) Built in '92 by city. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Two 6-in. wells, pumping from receiving reservoir to tank. PUMPS.—Smith-Vaile; two deep well and one dup. Bituminous pea coal used. av. cost, $1.25 per short ton. RESERVOIRS.—Cap., 102,000 galls.; 2—51,000 impounding and storage. TANK.—Cap., 57,000 galls.; total height, 100 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 145. Services, galv. i. Any consumer may have meter. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 61,000. PRESSURE.—Ordinary, 30 lbs.; fire, 45 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $12,000 (?), at 6%, due in '97. Sinking Fund, $200, at 6%. Expenses: Operating, $900. Revenue: Street sprinkling, $100. MANAGEMENT.—Prest., W. T. McLean; Secy., Guy T. Corault; Treas., D. H. Glassford; Supt., J. M. Ewing.

F 8. **MASON CITY,** Mason Co. (1,869.) Built by city in '90-1 for fire protection only. Supply, tubular well, pumping to 12 x 40-ft. stand-pipe. Mains, 1 mile. Hydrants, 12. Pressure, 60 lbs. Cost, $12,000. Debt, $9,000, at 6%. No rept. since '90-1 Manual.

116. **MATTOON,** Coles Co. (6,833.) Built in '85 by Mattoon Clear Water Co. FRANCHISE.—Provides for purchase of works by city in 1900, price to be determined by arbitration, if not agreed upon. Rates are fixed by city. Co. is not exempt from local taxes. City to pay for hydrant rental. SUPPLY.—Tubular wells, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.: Smith-Vaile; Deane; Dean Bros. and Hughes. Bituminous slack used. STAND-PIPE.—Cap., 150,000 galls.; 15 x 120 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Taps, 550; made by Co. Services, lead and galv. i.; paid for by consumer. Meters, 65; owned and controlled by Co.; yearly rental, none. Use of meters optional with consumer; compulsory for all large consumers. Co. can compel use of meters in all cases of willful violation of rules. Hydrants, public, 84. PRESSURE.—Ordinary, 30 to 40 lbs.; fire, 80 lbs., if necessary can increase to 200 lbs. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $76,000, at 6%.: $11,000, due 1900; $65,000, due 1905. Revenue, $5,930. MANAGEMENT.—Rept. by Secy. and Supt., Jno. T. Scott, June 5, '96. SEWERS.—Has storm sewers.

117. **MAYWOOD,** Cook Co. (2,076.) Built in '95 by village; put in operation Dec. 1. Engrs., Hill & Enricht; Contrs., Thatcher & Burke; all of Chicago. SUPPLY.—

Artesian well, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. non-cond. Illinois bituminous coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 150,400 galls.; steel; 16 × 100 ft. DISTRIBUTION.—Mains, 32 miles. Taps, 300; made by village at $12.50 for ¾-in. and $15 for ¾-in. Services, lead; pair for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 300. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $135,000 paid for by special assessment on 10-yr. installment plan. Expenses: Operating, $2,000. Revenue: Consumers, $1,200; public buildings, $100. Deficits are met by general fund. MANAGEMENT.—Prest. of Vill., E. C. Nichols. Rept. by Jacob Bohlander, Oct. 26, '96. SEWERS.—Has sanitary and storm sewers.

F 9. **MENDON,** Adams Co. (640.) Under construction in '96 by village; only fire protection at present. Contrs., Lowrie Implement Co., Keokuk, Ia. Supply, well, 1,010 ft. deep, pumping to tank. Pump, cap., 35,000 galls.; Goulds artesian, operated by gasoline engine. Tank, cap., 33,000 galls.; on steel tower 63 ft. high. Financial, cost, $5,500. Rept. by Vill. Clk., F. W. Battell, June 19, '96, and S. H. Bradley, Vill. Prest., Jan. 13, '97.

118. **MENDOTA,** La Salle Co. (3,542.) Built in '88 by town. SUPPLY.—Artesian well, 400 ft. deep, pumping to collecting reservoir and repumping to tank. PUMPS.—Deep well; also 1,175,000 Deane comp. dup. (rept. by makers as furnished in '95). RESERVOIR.—Cap., 144,000 galls.; 56 × 8 ft.; covered with conical roof. TANK.—Cap., 26,000 galls.; on 100 ft. tower; total height, 118 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 12½ miles. Taps, 600. Meters, 60. Hydrants, public, 89. CONSUMPTION.—(Galls.) av., 36,000. FINANCIAL.—Cost (in '88), $19,000. Bonded debt, $8,000, at 6%. MANAGEMENT.—City Clk., Geo. Holland; Supt., Louis Waldorf. Rept. by City Clk., Sept. 30, '96. REFERENCE.—Eng. News, May 9, '85.

—? **METAMORA,** Woodford Co. (758.) Makers rept. Goulds pump, driven by gasoline engine.

119. **METROPOLIS CITY,** Massac Co. (3,573.) Built in '92 by Co., city to pay $10,000 in cash on completion and $2,000 per yr. until paid for and owned by city. Contr., Geo. C. Morgan, New York Life Bldg., Chicago. PUMPS.—Cap., 1,700,000 galls.; two Deane dup. (rept. by makers). FINANCIAL.—Cost, about $38,000. NOTE.—Information mostly from press repts. in '92.

120. **MILAN,** Rock Island Co. (692.) Built in '95 by village; put in operation July 1. Engr., W. A. Darling, Rock Island. Contrs., Casgrain & McDonald, Chicago. SUPPLY.—Flowing well, direct to tank. TANK.—Cap., 30,000 galls.; 20 × 16 ft., on wood trestle 25 ft. high, on stone foundation. DISTRIBUTION.—Mains, 3 miles. Taps, 76; made by consumer. Services, ¾-in.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 17; private, 80. PRESSURE.—Ordinary, 18 lbs.; fire, 29 lbs. FINANCIAL.—Bonded debt, $8,000, at 6%; due $1,600 annually. Expenses: Operating, none. MANAGEMENT.—Village Board of Trustees. Prest., C. W. Thacher; Clk., C. H. Smith; Treas., Wm. Goldsmith. Rept. by W. R. Brown, Oct. 31, '96. SEWERS.—None.

121. **MILFORD,** Iroquois Co. (957.) Built in '96 by village; put in operation Jan. 1, '97. Engr., Jacob A. Harman, Peoria. Contr., H. D. Hallett, Aurora. SUPPLY.—Two 8-in. wells, 60 ft. deep, pumping to tank. PUMP.—Goulds triplex; driven by electric motor from light plant. TANK.—Cap., 58,000 galls.; steel; 20 × 25 ft., with conical bottom, on steel tower 80 ft. high. Contrs., Pa. Bridge Co., Beaver Falls, Pa. DISTRIBUTION.—Mains, 4 miles. Hydrants, public, 34. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $16,800. Bonded debt, $15,050, at 6%; due $4,250 in 11 to 20 yrs. (general); $10,800 in 1 to 9 yrs. (special assessment.) MANAGEMENT.—Cy. Clk., Harvey Stingley. Rept. by Engr., Jan. 5, '97. SEWERS.—None.

122. **MINONK,** Woodford Co. (2,316.) Built in '87-9 by village. SUPPLY.—Wells, pumping to tank. One deep well, 10 ins. in diam. at top and 6½ ins. at bottom, 1,755 ft. deep; water rises to within 150 ft. of surface; also one shallow well, 65 ft. deep, 4 ft. in diam. from bottom to within 30 ft. of top, balance 20 ft. in diam. PUMPS.—Hill vertical, 12 × 36-in. deep well pump, cylinder 400 ft. down; Blakeslee dup. in shallow well. Bituminous coal used; av. cost, $1.65 per short ton for nut and $2 for lump. TANK.—Cap., 56,700 galls.; wood; 20 ft. high, on wooden tower 80 ft. high. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by special assessment. Taps made by city for $7, including service to curb. Services, ¾-in.; paid for by city to curb. Meters, 2; owned, controlled and repaired by property owner. City can compel use of meters and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 60,000; max., 90,000; min., 40,000. PRESSURE.—Ordinary, 38 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $15,000. Expenses: Operating, $2,000. Revenue: Consumers, unmetered, $500; metered, $1,200. MANAGEMENT.—Mayor, F. W. Horneman. Rept. by City Clk., M. H. Pfaffiler, June 23, '96. PROJECTED IMPROVEMENTS.—Brick tower supporting a steel tank. SEWERS.—Has storm sewers.

123. **MOLINE,** Rock Island Co. (12,000.) Bought by city July, '86. Built in '83 by Davis & Co. SUPPLY.—Mississippi River, pumping direct. Settling basin previously reported. PUMPS.—Cap., 7,000,000 galls.; three Deane: 4,000,000 comp. cond.

dup., 1,500,000 and 500,000. Bituminous slack used; av. cost, $1.10 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 17¼ miles; cost extensions met by city appropriations. Taps, 1,125; made for consumer by licensed plumbers, who pay a license fee of $25 a year. Services, w. i.; paid for by property owner. Meters, 23; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for manufacturers. Hydrants, public, 188; private, 15. CONSUMPTION.—(Galls.) av., 2,000,000; max., 2,300,000; min., 1,800,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $60,000, at 4½%. Expenses: Operating, $11,879. MANAGEMENT.—Rept. by Supt., T. D. Wheelock, June 12, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 15, '82.

124. **MOMENCE,** Kankakee Co. (1,635.) Under construction '95-7 by city. Contract was let in '95 and construction started, but work was stopped while legality of special assessment plan was being tested in court. County and Supreme Court upheld assessment. In Feb., '97, contract was awarded to Seckner Contracting Co., Unity Building, Chicago, which made original plans for works. DISTRIBUTION.—(Probably.) Mains, 7 miles. Hydrants, 65. FINANCIAL.—Contract price ('97 award), $30,000. MANAGEMENT.—Cy. Clk., Chas. B. Astle.

— ? **MONEE,** Will Co. (445.) Makers rept. Goulds pump, driven by gasoline engine.

125. **MONMOUTH,** Warren Co. (5,936.) Built in '88-9 by city. SUPPLY.—Two artesian wells, pumping to collecting reservoir and repumping direct. Wells are in St. Peter's sandstone, 1,230 ft. deep, 5¼ ins. and 8 ins. diam. PUMP.—Cap., 1,000,000 galls.; 1,000,000 Holly dup. and two Downie deep-well. Bituminous coal used; av. cost, $1.78 per short ton, delivered. RESERVOIR.—Cap., 300,000 galls.; collecting. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 16½ miles; cost extensions met by general taxation. Taps, 651; made by city at $13 for ¾-in., including service to curb. Services, lead; paid for by consumer from curb. Meters, 40; owned, controlled and repaired by city. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 144; private, 4. CONSUMPTION.—(Galls.) av., 300,000; max., 375,000; min., 230,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. One steam fire engine is owned by city, but rarely used. FINANCIAL.—Cost, $85,000. Bonded debt, $50,000: $10,000, at 5%, due in '98; $10,000, at 5%, due in 1903; $10,000, at 5%, due in 1908; $20,000, at 5½%, due at various times until 1913. Sinking Fund, $7,200. Expenses: Operating, $4,985; int., $2,600. Revenue: Consumers, $4,038. Deficits are all met by general taxation. MANAGEMENT.—City Clk., J. Arthur Stevenson; Supt., Colin Roodhouse. Rept. by City Clk., Nov. 12, '96. SEWERS.—Has sanitary and storm sewers.

126. **MONTICELLO,** Piatt Co. (1,643.) Built in '92 by city. Engr. and Contr., Geo. C. Morgan, New York Life Bldg., Chicago. SUPPLY.—Two wells, one 6-in., 212 ft. deep, one 8-in., 309 ft. deep, pumping to collecting reservoir and repumping to tank and direct. PUMPS.—Cap., 850,000 galls.; Deane dup.; also Cook and American deep-well. Bituminous pea coal used; av. cost, $1.12 per short ton. RESERVOIR.—Cap., 56,800 galls.; collecting. TANK.—Cap., 40,000 galls.; iron; 12 × 48 ft., on brick tower 68 ft. high. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 5¼ miles; cost extensions met by water-works fund. Taps, 265; made by city at $3.20 for ½-in., $3.85 for ¾-in and $4.20 for 1-in. Services, iron; paid for by property owner. Meters, 27; owned, controlled and repaired by city. City can compel use of meters and and consumer may have one. Hydrants, public, 47. CONSUMPTION.—(Galls.) av., 80,000; max., 250,000; min., 60,000. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $4,000, at 6%; due $1,000 yearly. Sinking Fund, $1,000. Expenses: Operating, $1,400; int., $60. Revenue: Consumers, unmetered, $1,200; metered, $400; public buildings, $80. MANAGEMENT.—Rept. by Ch. Pump. Engr., J. W. Wiley, Jan. 4, '97. SEWERS.—None.

127. **MORGAN PARK,** Cook Co. (1,027.) Built in '74 by village. SUPPLY.—Deep wells, pumping to (tank?). In '91 there was a 6-in. well, sunk 200 ft. in bottom of 200-ft. shaft. Since then other wells have apparently been sunk. PUMPS.—In '91 a 500,000-gall. Gordon deep well pump was used. In '96 makers rept. 500,000-gall. Worthington high pressure; also two air-lift plants, with 10 × 14-in. Rand compressors. TANK.—(In '89.) Cap., 100,000 galls. DISTRIBUTION.—(Nov. 17, '91.) Mains, 10 miles. Taps, 325. Hydrants, 14; 100 were to be added in '92. FINANCIAL.—Cost (in '87), $35,000. NOTE.—Latest official rept., Nov., '91, by W. P. Rounds, then Engr. and Supt. REFERENCE.—Eng. News, May 16, '85.

128. **MORRIS,** Grundy Co. (3,653.) Built in '94 by city; put in operation in Dec. Engrs., Voorhees & Witmer, Buffalo, N. Y. SUPPLY.—Artesian wells, pumping with air-lift to collecting reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane comp. dup; also air-lift, with Clayton compressor. Bituminous coal used; av. cost, $1.90 per short ton. STAND-PIPE.—Cap., 105,762 galls.; steel; 12 × 125 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by taxes. Taps, 305; made by city; paid for by consumer. Services, galv. i.; paid for by property owner. Meters, 5; owned and repaired by consumer; controlled by city. City can compel use of meters and any consumer may

have one. Hydrants, public, 67. CONSUMPTION.—(Galls.) av., 9,000; max., 10,000; min., 8,000. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. Steam fire engines are used. FINANCIAL.—Cost, $88,000. Bonded debt, $30,000, at 5%; due 10 to 20 yrs. Sinking Fund, $3,000. Expenses: Operating, $2,300; int., $1,500. Revenue, $3,270: Street sprinkling, $270; other purposes, $3,000. Deficits are met by taxation and revenue. MANAGEMENT.—Mayor, H. E. Palmer; Clk., H. C. Claypool. Rept. by Ch. Pump. Engr., U. C. Davis, Sept. 3, '96. SEWERS.—Has storm sewers only.

129. **MORRISON,** Whiteside Co. (2,088.) Built in '69 by town. SUPPLY.—Spring, pumping to tank and direct. PUMP.—Cap., 2,000,000 galls.; Worthington. Illinois bituminous coal used; av. cost, $3 per short ton. TANK.—Cap., 215,910 galls.; 35 × 30 ft. FISCAL YEAR CLOSED in Apr. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by tax. Taps, 425; made by city, free. Services, w. i.; paid for by consumer. Meters, 3; owned, controlled and repaired by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 28 lbs.; fire, 155 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $2,000: $1,000, at 5%, due in '97; $1,000, at 5%, due in '98. Expenses: Operating, $2,000. Revenue, $3,200; street sprinkling, $90. MANAGEMENT.—Mayor, H. A. Boyd; City Clk., J. N. Baird; City Treas., A. R. Lewis; Ch. Pump. Engr., I. H. Parrish. Rept. by Supt., H. G. Parrish, July 16, '96. SEWERS.—Has sanitary and storm sewers.

130. **MORRISONVILLE,** Christian Co. (844.) Built in '88-9 by village. SUPPLY.—Wells, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; Worthington dup. Bituminous nut coal used; av. cost, $1.50 per short ton. TANK.—Cap., 37,000 galls.; cypress; 20 × 16 ft., on 60-ft. wooden trestle. DISTRIBUTION.—Mains, ½ mile; cost extensions met by general taxation. Taps made by village. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 15,750; max., 25,200; min., 6,300. PRESSURE.—(In '88.) Ordinary, 33 lbs.; fire, 60 to 75 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $5,000, at 6%; due 1908. Expenses: Operating, $300; int., $300. Revenue: Consumers, $200; sewer flushing, $80; other purposes, $20. Deficits are all met by taxation. MANAGEMENT.—Ch. Pump. Engr., R. B. Miller. Rept. by H. H. Herdman, June 5, '96. SEWERS.—None.

131. **MORTON,** Tazewell Co. (657.) Built in '98 by village. Engr., Jacob A. Harman, Peoria. Contr., Jacob Mathis. SUPPLY.—Deep well, pumping to elevated tank. Private parties are employed to do pumping at one cent per bbl. (about 31 cts. per 1,000 galls.), furnishing their own power and pumping machinery. TANK.—Cap., 78,000 galls.; wood; on brick tower. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 2 miles; cost extensions met by frontage tax and general fund. Taps made by consumer for $3. Services, galv. i.; paid for by consumer. Meters, 15; owned and repairs paid by consumer; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 10,000; max., 15,000; min., 3,000. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $6,500. Bonded debt, $4,000, at 6%; due in payments of $500 from 1904 to 1912, inclusive. Expenses: Operating, $500 to $800. Deficits are met by general taxation. MANAGEMENT.—Prest. of Village Council, Fred. Reuling; Clerk, C. May. Rept. by W. R. Lackland, ex-Prest. of village, Jan. 8, '97. SEWERS.—None.

P 10. **MOUND CITY,** Pulaski Co. (1,965.) Dec. 30, '96, H. G. Carter rept. city was considering works.

132. **MOUNT CARMEL,** Wabash Co. (3,876.) Built in '93 by Mt. Carmel Light & Water-Works Co.; tested in Sept. (press rept.) Dec., '96, citizen rept. officers as follows: Prest., H. C. Rogers, Waterford, N. Y.; Supt., C. C. Strasser.

133. **MOUNT CARROLL,** Carroll Co. (1,836.) Built in '88 by village. SUPPLY.—Well, 2,500 ft. deep, pumping to tank. PUMP.—Cap., 750,000 galls.; Gordon. May 22, '95, E. T. E. Becker, Chn. W.-W. Com., rept. contract had just been awarded for 530,000-gall. Bacon air-lift plant. DISTRIBUTION.—Mains, 2 miles. Taps, 80. Hydrants, 22. FINANCIAL.—(In '88.) Cost, $18,000. Bonded debt, $18,000, at 6%. NOTE.—No rept. since '90-1 Manual, except as noted.

— ? **MOUNT MORRIS,** Ogle Co. (895.) Under construction in '97. PUMP.—Cap., 200,000 galls.; driven by 9-HP. Otto gas engine (rept. by makers of engine).

P 11. **MOUNT OLIVE,** Macoupin Co. (1,986.) In '95 village bought 80 acres of land and built reservoir at total cost of $13,000, $8,000 of which was raised by bonds. Works will be completed "as soon as sufficient funds can be obtained, which will probably take about 4 or 5 yrs." Rept. by Vill. Clk., H. H. Droste, June, '96.

134. **MOUNT PULASKI,** Logan Co. (1,357.) Built in '82 by village. Works rebuilt in '95. Des. Engr., D. H. Maury, Peoria. Const. Engr., Jacob H. Harman, Peoria. SUPPLY.—(In '89.) Well, pumping to tank. PUMPS.—Cap., 925,000 (?) galls.: 350,000 Hooker-Colville in '89; makers rept. 575,000 Deane comp. dup. furnished in '95. TANK.—(In '89.) Cap., about 50,000 galls. New tank rept. as having cap. of 60,000 galls.; 20 × 24 ft., on 60-ft. tower. DISTRIBUTION.—(In '88.) Mains, 4 miles. Taps, 200. Meters, 0. Hydrants, 36. PRESSURE.—(In '89.) 35 lbs. FINANCIAL.—(In '88.) Cost, $6,000. No debt. Expenses, $1,500. Revenue: Consumers, $1,200. NOTE.—No official rept. since '90-1 Manual. Rept. that about 5 miles of mains were added in '95 and that this and other improvements cost $26,000.

135. **MOUNT STERLING,** Brown Co. (1,655.) Built in '95 by Co.; put in operation in May. FRANCHISE.—20 yrs. from '95; does not provide for purchase of works by city. Rates are not fixed in franchise. Co. not exempt from local taxes. City to pay $50 per fire hydrant yearly. No legal difficulties. SUPPLY.—Open well, pumping to reservoir and direct. PUMP.—Gardner. Bituminous slack used; av. cost, 85 cts. per short ton. FILTERS.—Charcoal. RESERVOIRS.—Cap., 450,000 galls. DISTRIBUTION.—Mains, 2 miles. Services, w. i.; paid for by consumer. Hydrants, public, 10. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Revenue: City, fire protection, $500. MANAGEMENT.—Secy., R. C. Washburn; Treas., Jas. L. Gray. Rept. by City Clk., A. E. Condee, Aug. 7, '96. SEWERS.—None.

136. **MOUNT VERNON,** Jefferson Co. (3,233.) Built in '91 by Mount Vernon Water-Works Co. Engrs. and Contrs., Walton & Co., Litchfield. FRANCHISE.—20 yrs. from '91. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artificial lake, pumping direct. PUMPS.—Cap., 3,250,000 galls.: 2,500,000 Deane comp. dup.; 750,000 McGowan dup. high pressure. (Cap. rept. by makers in each case.) Bituminous coal used; av. cost, 75 cts. per short ton. RESERVOIR.—Cap., 60,000,000 galls.; impounding, ½ mile from city. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by rentals. Taps, 300; made by consumer for $1.50. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 45; private, 4. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Cap. Stock: Authorized, $40,000; paid-up, $25,000. Floating debt, $15,000, at 7%. Bonded, none. Expenses: Operating, $2,500; taxes, $165. Revenue: Consumers, $5,500; City, fire protection, $2,200; street sprinkling, $250. MANAGEMENT.—Prest., C. D. Hain; Secy. & Supt., A. C. Johnson; Treas., R. J. Bond; Ch. Pump. Engr., Wilbur Ayers. Rept. by Supt., Oct. 3, '96. SEWERS.—Has sanitary and storm sewers.

137. **MOWEAQUA,** Shelby Co. (843.) Built in '93 by village. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Wells, pumped to stand-pipe. TANK.—Cap., 45,000 galls. (press rept.). DISTRIBUTION.—Mains (press rept. in '93), 3,500 ft. FINANCIAL. Cost, $5,000. MANAGEMENT.—Pump. Engr., Andrew Black. Rept by citizen, Oct. 24, '96.

138. **MURPHYSBORO,** Jackson Co. (3,880.) Built in '90 by Murphysboro Water-Works, Electric & Gaslight Co. SUPPLY.—Big Muddy River, pumping to stand-pipe. PUMP.—Hughes rept. by makers. FILTERS.—Hyatt, 250,000 galls., installed in '90. Western filter rept. as added later. STAND-PIPE.—Cap., 118,000 galls.; 15 × 150 ft. DISTRIBUTION.—Mains, 4.5 miles. Taps, 200. Meters, 1. Hydrants, 60. FINANCIAL. —Cost, $75,000. Cap. Stock, entire plant: Authorized, $60,000; all paid-up. Debt, $62,000: Floating, $2,000; Bonded, $60,000, at 6%, due 1910. Expenses, $13,600: Operating, $10,000; int., $3,600. Revenue, $13,200: Consumers, $7,200; City, fire protection, $3,000; other purposes, $3,000. NOTE.—No official rept. since 90-1 Manual.

—? **NEWTON,** Jasper Co. (1,428.) Built in '93 by Robt. Hardy. Supt., Richard Holt. Rept. by Jno. Wise, Jr., June, '96. No sewers.

139. **NOKOMUS,** Montgomery Co. (1,305.) Built in '95 by city; put in operation Apr. 1. Engr. and Contr., Chas. Tobin, Hillsboro. SUPPLY.—Driven wells, pumping to tank and direct. PUMPS.—Cap., 240,000 galls. Av. cost of coal used, 75 cts. per short ton. TANK.—Cap., 43,000 galls.; iron; 13 × 52 ft., on brick tower 50 ft. high. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by taxation. Taps, 67; made by consumer for $1. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 48 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $7,500 at 6%, due Oct. 10, 1914. Expenses: Operating, $400; int., $450. Revenue: Consumers, $475; street sprinkling, $120. Deficits met from water fund. MANAGEMENT.—Rept. by Mayor, Jno. Hukill, Sept. 8, '96. SEWERS.—None.

35. **NORWOOD PARK,** Cook Co. Now part of Chicago, which see.

140. **OAK PARK,** Cook Co. (4,771.) Owned by Cicero Water, Gas & Electric Light Co. Built in '85 by Jas. W. Scoville; sold in '87 to above Co. Supplies Austin. Dec., '96, town was talking of buying works. FRANCHISE.—Does not provide for purchase of works by city. Rates are not controlled by city. SUPPLY.—Four artesian wells, pumping to stand-pipe. PUMPS.—Cap., 4,500,000 (?) galls.: 3,000,000 Worthington; 1,500,000 Deane comp. dup.; also 2—2,000,000 Allis air-lift plants (rept. by maker). STAND-PIPE.—105 ft. high. DISTRIBUTION.—Mains, 37 miles. Taps, 1,300. Meters, 125. Hydrants, 277. PRESSURE.—Ordinary, 40 lbs.; fire 60 lbs. FINANCIAL.—(In '90.) Cost, $150,000. Cap. Stock: Authorized, $100,000; all paid-up; paid 6% div'd in '90. Bonded debt, $100,000 at 6%; 5-20s. Expenses, $10,000. Revenue, $25,000: Consumers, $12,000; City, fire protection, $7,000; other purposes, $6,000. NOTE.—Latest official rept. from Supt., F. M. Jackson, June 25, '91.

P 12. **ODELL,** Livingston Co. (800.) Oct., '96, well had been sunk 600 ft., but no water struck. Works will probably be built if water is secured.

—? **O'FALLON,** Saint Clair Co. (865.) O'Fallon Electric Light, Power, Heat & Water Co. incorp. July, '94, by S. C. Smiley, Jos. Porter and others. Authorized cap.

stock, $20,000. Press rept. Dec. 7, '94, stated water and electric light plant would be put in operation Dec. 15, '94. No response to inquiries.

141. **OHIO,** Bureau Co. (364.) Built in '95 by village. Engrs. and Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—6-in. tubular well, 385 ft. deep, pumping to tank. PUMP.—Cap., 45,000 galls.; 20-HP. Aurora steam pump. TANK.—Cap., 25,000 galls.; 16 × 16½ ft., on steel tower 75 ft. high. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 2 miles; cost extensions met by general taxation. Taps, 75; made by village for $6, including service to sidewalk. Services, galv. 1.; paid for by consumer from sidewalk. Meters, 4. Village can compel use of meters and any consumer may have one. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 8,000; max., 10,000; min., 6,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $7,000. MANAGEMENT.—Rept. by Supt., H. E. Walter, Dec. 12, '96. SEWERS.—None.

142. **OLNEY,** Richland Co. (3,831.) Built in '92 by city. SUPPLY.—Fox River, pumping to water-tower. Dam across river. PUMPS.—Cap., 2,000,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). STAND-PIPE.—Cap., 35,000 galls.; iron; 11 × 48 ft., on brick tower 70 ft. high. DISTRIBUTION.—Hydrants, 30. PRESSURE.—Ordinary, 65 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $30,000. Rept. by W. A. Cope, Dec. 12, '96. SEWERS.—Has sanitary and storm sewers.

143. **ONARGA,** Iroquois Co. (994.) Built in '95 by Onarga Electric Light & Water-Works Co.; put in operation Sept. 1. FRANCHISE.—10 yrs. SUPPLY.—Three artesian wells, pumping to reservoir. PUMP.—Cap., 25,000 galls.; Gardner. RESERVOIR.—Cap., 25,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 20. Hydrants, 4. CONSUMPTION.—(Galls.) av., 1,500. PRESSURE.—Ordinary and fire, 35 lbs. FINANCIAL.—Cost, $2,000. MANAGEMENT.—Supt., J. E. Owen. Rept. by H. M. Lovell, Jan. 18, '97.

P 13. **ORANGEVILLE,** Stephenson Co. (347.) Contract for works for general supply let by village Dec., '96, to Fairbanks, Morse & Co., Chicago, works to be completed by May 1, '97. Engrs., A. Lagrove & Son, Freeport. SUPPLY.—Well, pumping to tank. FINANCIAL.—Cost, est., $10,000. MANAGEMENT.—Prest., S. S. Hutchins. Rept. by Clk., E. D. Mahany, Dec. 14, '96.

144. **OREGON,** Ogle Co. (1,566.) Built in '78 by city. SUPPLY.—Wells, pumping to reservoir. PUMP.—Cap., 720,000 galls.; Goulds, driven by electric motors. Pumping is done on contract by the Oregon Electric Light & Power Co. for $80 a month; after 5 yrs., price to be 4 cts. per 1,000 galls. City owns pumping plant. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 5 miles; cost extensions met by water fund. Taps, 170; made by city for $3. Services, lead; paid for by property owner. Meters: 10; owned and controlled by city; repairs paid by property owner. Use of meters compulsory for factories. City can compel use of meters and any consumer may have one. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 95 lbs. FINANCIAL.—Cost, $15,000. No debt. Expenses, Operating, $960. Deficits are met by general taxation. MANAGEMENT.—Rept. by W. L. Taylor, Feb. 5, '97. SEWERS.—Has sewers.

145. **OSWEGO,** Kendall Co. (641.) Built in '95 by city. SUPPLY.—Driven wells, pumping to tank. PUMP.—Cap., 130,000 galls.; driven by 4-HP. gasoline engine; Contrs., Henion & Hubbell, Chicago. MANAGEMENT.—Vill. Clk., Lewis P. Voss. REFERENCE.—Pumping plant, Eng. News, May 28, '96, illus. and inset.

146, D 3. **OTTAWA,** La Salle Co. (9,985.)

CITY WORKS.

Built in '95 by Ottawa Water Co.; put in operation Apr., '95; city took possession June 3, '96. Engr., N. E. Stucker. Contrs., Gregory Reed & Co., Chicago. Co. built under 30-yr. franchise, with provision that city should pay it $60,000 at completion and stipulated yearly sums for 20 yrs., the advance and yearly payments to be in lieu of hydrant rental, and works to become property of city at end of 20 yrs. Co. was to issue $100,000 of bonds, which were to be redeemed by above yearly payments. City had right to take possession and operate works at any time, which it did on June 3, '96. SUPPLY.—Six artesian wells and Fox River, pumping to stand-pipe. Wells are 380 to 395 ft. deep, with 6-in. casings for 285 ft. River used only when wells are insufficient, which in '96 was from June to Sept. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Worthington comp. cond. Bituminous run of mine coal used; av. cost, $1.73 per short ton and slack, $1.15. RESERVOIR.—Cap., 500,000 galls. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft., 98 ft. above business portion of city. DISTRIBUTION.—Mains, 25 miles. Taps, 600; made by consumer, no fee. Services, lead; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 152. CONSUMPTION.—(Galls.) max., 900,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $160,000. Bonded debt: $60,000 issued by city and $100,000 by Co.; latter at 6%, payable $2,700 in '96, $2,900 in '97, and in increasing amounts to $8,200 in 1915; payments arranged to make, with int., about $8,700 per yr. MANAGEMENT.—Rept. by Supt., Chas. Hahn, Aug. 8, '96, except details of franchise and bond payments. PROJECTED IMPROVEMENTS.—A greater supply. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Artesian wells, Eng. News, Apr. 18, '95, illus.

PRIVATE WORKS.

Built in '60 by individual, chiefly to supply business houses. Springs, by gravity. Mains, 4 miles. Taps, 125. Meters, 1. Hydrants, 3. No rept. since '90-1 Manual.

147. **PANA,** Christian Co. (5,077.) Built in '94 by city. Engrs., Voorhees & Witmer, Buffalo, N. Y. Contr., Chas. A. Stookey, Belleville. SUPPLY.—Wells, pumping to stand-pipe. PUMP.—Cap., 750,000 (?) galls.; Worthington comp. non-cond. (makers rept. two of these). Bituminous slack coal used; av. cost, 30 cts. per short ton. STANDPIPE.—Cap., 235,000 galls.; iron; 20 × 100 ft. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 10 miles; cost extensions met by appropriations. Taps, 325; made by consumer for $2 and $3. Services paid for by consumer. Meters: 25; owned, controlled and repaired by consumer. Use of meters compulsory for large consumers; any consumer may have one. Hydrants, public, 85. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Bonded debt, $37,500 at 6%; due in 1914. Expenses: Operating, $1,000; int., $2,250. Revenue: Consumers, unmetered, $2,900; metered, $600. MANAGEMENT.—Ch. Pump. Engr., J. C. Allen. Rept. by F. M. Elliott, Jan. 20, '97. SEWERS.—None. REFERENCE.—Stand-pipe, Eng. News, May 2, '95.

148. **PARK RIDGE,** Cook Co. (987.) Built in '87 by village. SUPPLY.—Artesian well, about 1,500 ft. deep, pumping to tank and direct. PUMPS.—Cap., 550,000 galls.; 200,000 Worthington simple high pressure; Deane dup. TANK.—Cap., 30,000 galls.; iron, on brick tower. DISTRIBUTION.—Mains, 3,600 ft. Taps, 36. Meters, 11. Hydrants, 2. PRESSURE.—(In '89.) Ordinary, 30 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $6,000. NOTE.—No rept. since '90-1 Manual.

149. **PARIS,** Edgar Co. (4,996.) Built in '79 by city. SUPPLY.—Ground water, pumping from impounding reservoir direct and to elevated tank. PUMPS.—(In '89.) Cap., 2,000,000 galls.; two Blake dup. high pressure. RESERVOIR.—Cap., 4,000,000 galls. Area, 60 acres; 1½ miles from city. TANK.—Cap., 106,000 galls.; steel, 22 × 80 ft., with hemispherical bottom in addition. Contrs., Chicago Bridge & Iron Co. DISTRIBUTION.—Mains, 14 miles. FINANCIAL.—Cost (in '88), $53,277. Bonded debt, $32,000; $15,000, at 7%; $17,000, at 5%. MANAGEMENT.—Mayor, W. O. Pinnell; Clk., C. H. Hodge; Supt., F. B. Dudley. REFERENCE.—Eng. News, Aug. 20, '81.

150. **PAW PAW,** Lee Co. (Est., 850.) Built in '91 by village; put in operation in Dec. Contrs., U. S. Wind Engine & Pump Co., Batavia. SUPPLY.—Artesian well, 1,018 ft. deep, pumping to tank. PUMP.—Cap., 150,000 galls.; Eclipse deep-well. Bituminous coal used; av. cost, $2 per short ton. TANK.—Cap., 55,000 galls.; wood, 18 × 24 ft., on wood trestle 70 ft. high to water line. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 1 mile; cost extensions met by general tax. Taps, 50; made by village, free. Services, iron; paid for by owner from sidewalk. Hydrants, public, 6. FINANCIAL.—Cost, $10,000. MANAGEMENT.—Rept. by Vill. Prest., Chas. F. Preston, Dec. 30, '96. SEWERS.—Has storm sewers only.

151. **PAXTON,** Ford Co. (2,187.) Built in '87-8 by village. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 40,000 galls. TANK.—Cap., 60,000 galls.; 18 × 24 ft., on tower 80 ft. high. DISTRIBUTION.—Mains, 3½ miles. Taps, 235. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—(In '88.) Ordinary, 35 to 50 lbs. FINANCIAL.—Debt, $1,000, at 6%; due in '98. Expenses, $1,100. Revenue, $1,200. MANAGEMENT.—Committee of Management, Chn., J. W. Reed. Rept. by City Clk., David C. Swanson, Sept. 24, '96.

—? **PEARL CITY,** Stephenson Co. (Not given.) Built in '93 by village. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. Supply is probably pumped.

152. **PECATONICA,** Winnebago Co. (1,059.) Built in '89-90 by village. SUPPLY.—Springs, pumping to tank. PUMPS.—Cap., 250,000 galls.; Deane. TANK.—Cap., 60,000 galls., on brick tower. DISTRIBUTION.—Mains, 1 mile. Taps, 50. Hydrants, public, 12. FINANCIAL.—Cost, $15,000. Debt, $8,000, at 5%. NOTE.—No rept. since '90-1 Manual.

153. **PEKIN,** Tazewell Co. (6,847.) Built in '86 by Pekin Water-Works Co. FRANCHISE.—Provides for purchase of works by city at end of 10 yrs.; council appointed com. to investigate matter in '96 (press repts.). SUPPLY.—Driven well, pumping to tank and direct. PUMPS.—Cap., 3,000,000 galls.; Blake. TANK.—Cap., 129,250 galls.; 20 × 55 ft., on 80-ft. tower. DISTRIBUTION.—Mains, 11 miles. Taps, 800. Meters, 2. Hydrants, public, 111. CONSUMPTION.—(Galls.) av., 350,000. PRESSURE.—(In '88.) Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock, $100,000. Bonded debt, $100,000, at 6%. NOTE.—No rept. since '90-1 Manual.

154. **PEORIA,** Peoria Co. (41,024.) Bought in '89 by Peoria Water Co.; built in '67-8 by city; went into hands of receiver Jan. 9, '94. FRANCHISE.—Provides for purchase of works by city in '99 and at intervals of 10 yrs thereafter. LEGAL DIFFICULTIES.—Illinois Appellate Court decided in June, '96, that city exceeded debt limit in contracting for hydrant rental. Suit was for balance on last quarter of '94 and for first quarter of '95. In '96 receiver appealed to U. S. Circuit Court for directions regarding furnishing water for fire protection, city still refusing to pay hydrant rental. After hearing before Comr., arbitrators were appointed, who, in Feb., '97, decided as

follows: That $3,526 be deducted on account of city contracting to exceed debt limit; $1,049 for shortage of water during drought; and $193 for expense incurred by city; that city had not suffered because stand-pipes had not been kept in use; that in general contract had been complied with, except in matter of shortage of supply. SUPPLY.—Open wells, pumping to reservoir and direct. PUMPS.—Cap., 21,000,000 galls.; 3—7,000,000 Worthington vert. comp. high duty. Bituminous slack used; av. cost, 66⅔ cts. per short ton; pea, 80 cts.; run of mine, $1.00 to $1.25. RESERVOIR.—Cap., 19,000,000 galls.; storage and distributing, located three miles from city. STAND-PIPES.—Formerly two; one was wrecked Mar. 30, '94; other apparently not in use. DISTRIBUTION.—Mains, 84 miles. Taps, 3,500; made by Co., free. Services, lead; paid for by Co. to curb. Meters, 850; owned by Co. and consumers; controlled and repaired by Co. Use of meters compulsory for large consumers, but not for any class of private dwellings. Co. can compel use of meters and any consumer may have one by buying it. Hydrants, public, 1,015; private, 14. CONSUMPTION.—(Galls.) av., 4,000,000; max., 5,000,000; min., 3,000,000. PRESSURE.—Ordinary, 120 to 40 lbs. FINANCIAL.—(In '88.) Cost (in '87), $450,000. Bonded debt, $450,000, at 6%. Revenue: Consumers, $34,000. MANAGEMENT.—Prest., E. F. Leonard; Secy. and Treas., E. D. Usner; Receiver, Cornelius B. Gold, 15 Wall St., N. Y. city; Supt., Dabney H. Maury, Jr.; Ch. Pump. Engr., R. R. Martin. Rept. by Supt., July 11, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News: General, Dec. 3, '81, July 14, 21, '92, with insets; Worthington high duty pump, June 23, '92, illus.; stand-pipe accident, Apr. 5, 12, 26 (with inset), May 10 and Oct. 4, '94, illus.; tests of vitrified pipe joints and conduit construction, May 21, '96.

155. **PEOTONE**, Will Co. (717.) Built in '96 by village; put in operation May 1. Engrs. and Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—Source not given, pumping to tank. PUMPS.—Cap., 72,000 galls.; Howe. TANK.—Cap., 63,000 galls.; wood; on 70-ft. brick tower. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 1½ miles. Taps, 30; made by consumer for $5. Services, lead; paid for by consumer. Village cannot compel but may prohibit use of meters. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 22,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $8,000, at 6%; due in 8 yrs. MANAGEMENT.—Rept. by Geo. Rehkopf, June 19, '96. SEWERS.—Has storm sewers only.

156. **PERU**, La Salle Co. (5,550.) Owned by city; put in operation Jan. 1, '92. Built by Co., and turned over to city on completion, city paying fixed sum at start and balance in yearly installments, besides an annual rental. Engr., Chas. H. Ledlie, St. Louis. Contr., E. Sutphin, St. Louis. SUPPLY.—Artesian wells, by gravity to receiving reservoir, thence pumping to stand-pipe. First well, 6 ins. × 1,365 ft. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Gordon comp. dup. Bituminous screening used; av. cost, 65 cts. per short ton. RESERVOIR.—Cap., 296,000 galls. STAND-PIPE.—Cap., 190,000 galls.; ⅝ to ¼-in. steel; 18 × 100 ft., on masonry foundation. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 12 miles; cost extensions met by public funds. Taps, 600; made by city for $10. Services, galv. i.; paid for by city. Meters, 40; owned by consumer; repairs paid by consumer. Use of meters optional with consumer. Hydrants, public, 80; private, 5. CONSUMPTION.—(Galls.) av., 227,830; max., 450,000; min., 180,000. PRESSURE.—Ordinary, 50 to 100 lbs.; fire, 125 lbs. FINANCIAL.—Cost (in '92), about $70,000. Expenses, for water and light plant combined, $4,811. MANAGEMENT.—Supt., Theo. Weberling. Rept. by Cy. Clk., P. F. Keegan, July, '96, and Engr., in '92. SEWERS.—Has storm and partial system of sanitary sewers.

157. **PETERSBURG**, Menard Co. (2,342.) Built in '87-8 by village. SUPPLY.—Four 8-in. wells, pumping to tank. PUMPS.—Cap., 480,000 (?) galls.; Buffalo. Makers also rept. 750,000 Worthington comp. non-cond. TANK.—Cap., 185,000 galls.; 30 × 35 ft. DISTRIBUTION.—Mains, 2.5 miles. Taps, 102. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—(In 88.) 70 lbs. FINANCIAL.—Cost, $26,500. Bonded debt, $19,000, at 5%; due '97-1907. Expenses, $2,150: Operating, $1,200; int., $950. Revenue: Consumers, $1,600. NOTE.—No rept. since '90-1 Manual.

F 10. **PINCKNEYVILLE**, Perry Co. (1,298.) Built in '87-8 by town, principally for fire protection and street sprinkling. Supply, surface well, with 2,000 ft. artesian well sunk from its bottom, pumping to tank. Pumps, deep well, 3¼ × 42 ins. Tank, cap., 39,750 galls.; iron; 15 × 36 ft., on 68-ft. tower. Mains, 1 mile. Hydrants, 10. Pressure, 50 lbs. Cost, $15,000. Debt, $3,000; int., 7%. Expenses, operating, about $250. From '89-90 Manual.

F 11, P 14. **PITTSFIELD**, Pike Co. (2,295.) Built in '87-8 by town for fire protection and street sprinkling only. Supply, well, 2,200 ft. deep, pumping with 50,000-gall. walking-beam pump to tank in heart of city. Supply is falling. Bituminous slack used; av. cost, $2.25 per short ton. Tank, cap., 60,000 galls.; iron; 30 × 10 ft., on brick tower 100 ft. high. Mains, 1 mile; cost extensions met by licenses and tax levy. Hydrants, 12. No debt. Operating, $16,000. Revenue: City, fire protection, $2,000; other purposes, $14,000. Supt., C. E. Strong. Rept. by Secy., Louis Klemme, Jr., July 10, '96. It is proposed to bond the city for $40,000 in the near future to build complete works.

158. **PLANO**, Kendall Co. (1,825.) Built in '91 by city. Engr., F. S. Hadlock. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 180,000 galls.; Blake. TANK.—Cap.,

55,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 150. Services, galv. i. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 35 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $1,500. Expenses: Operating, $800. MANAGEMENT.—Rept. by F. S. Hadlock, Jan. 18, '97.

P 15. **PLYMOUTH,** Hancock Co. (710.) Village secured authority to build works early in '97 and expected to start construction Mar. 1. Supply, artesian well, pumping to tank on 60-ft. tower. General supply to be furnished. Est. cost, $3,200.

159. **POLO,** Ogle Co. (1,728.) Built in '91 by city; put in operation Jan. 1, '92. Fire protection system formerly was supplied from tank of Ill. C. R. R. Co. Engr., Geo. Cadogan Morgan, Chicago. SUPPLY.—Artesian well, 2,100 ft. deep, pumping to collecting well and repumping to tank and direct. PUMPS.—Cap., 500,000 galls.: 500,000 Deane dup.; also 125,000 Deane deep well. Bituminous nut coal used; av. cost, $1.60 per short ton. RESERVOIR.—Cap., 30,000 galls. TANK.—Cap., 26,000 galls.; steel, 11 × 36 ft., on brick tower 80 ft. high, on hill 30 ft. above city. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by taxation. Taps, 267; made by city, free. Services, galv. i.; paid for by property owner. Meters: 5; owned, controlled and repaired by property owner. Use of meters optional with consumer. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 75,000; max., 100,000; min., 50,000. PRESSURE.—Ordinary, 50 lbs.; fire, 75 to 100 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $12,000, at 5%, due in 1907. Expenses: Operating, $975; int., $600. Revenue, Consumers, $2,205. No deficits. MANAGEMENT.—Chn. W.-Wks. Com., L. F. Thomas; Supt., Jas. H. More; Ch. Pump. Engr., John Boward. Rept. by Chn., July 15, '96. SEWERS.—None.

160. **PONTIAC,** Livingston Co. (2,784.) Built in '93 by Pontiac Water, Light & Power Co.; put in operation in June. Engr. and Contr., J. J. Hainsworth. FRANCHISE.—Exclusive for 20 yrs. Provides for purchase of works by city at end of any 5 yrs. of franchise or extension thereof, price to be determined by arbitration; city may refuse to buy works at price fixed, but such refusal, if at expiration of franchise, or renewal of same, shall constitute a renewal of it. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $2,500 per yr. for 60 hydrants and $45 each for additional ones on extensions; city may place additional hydrants on original mains at its own expenses, without rental. No legal difficulties. SUPPLY.—Vermilion River, pumping to tank and direct. PUMPS.—Cap., 2,000,000 galls.; Gordon. Av. cost of coal used, $1.20 per short ton. FILTERS.—Cap., 1,200,000 galls.; Western. STAND-PIPE.—Cap., 165,000 galls.; steel, 15 × 125 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 5 miles. Taps, 250; made by Co., free. Services paid for by consumer, except that for sizes less than 1-in. Franchise provides Co. must lay services from mains to outer edge of sidewalk, free. Meters, 1. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 15. CONSUMPTION.—(Galls.) av., 750,000; max., 1,000,000; min., 500,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. MANAGEMENT.—Prest., W. P. Dickinson, Chicago, Ill.; Secy., W. R. Dickinson; Treas., J. W. Dickinson; Supt., H. L. Traphagen; Ch. Pump. Engr., Jas. Murphy. Rept. by W. J. Butler, July 27, '96, and Engr., in '92. SEWERS.—Has sanitary and storm sewers.

161. **PRINCETON,** Bureau Co. (3,396.) Built in '89-90 by city. SUPPLY.—8-in. driven wells, 2,515 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; 175,000 Cook deep-well and 1,000,000 Barr comp. dup. TANK.—Cap., 56,000 galls.; 14 × 50 ft., on 50-ft. tower. DISTRIBUTION.—Mains, 3.3 miles. Taps, 210. Services, galv. i. and lead. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 65,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $27,500. Bonded debt, $26,000 at 5%. Expenses, $1,750. NOTE.—No rept. since 90-1 Manual.

36. **PULLMAN,** Cook Co. See Chicago.

162. **QUINCY,** Adams Co. (31,494.) Owned by L. & W. B. Bull; built in '73 by Co. FRANCHISE.—30 yrs. from '73; provides for purchase of works by city at expiration of franchise. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $9,000 per yr. for public service. No legal difficulties at present. State Supreme Court, some yrs. ago, decided against Co. in suit for $48,000 hydrant rental, ruling that 30-yr. contract for hydrant rental was illegal, because at time of making it city had already exceeded debt limit. SUPPLY.—Mississippi River, pumping to reservoir; filtered. PUMPS.—Cap., 16,000,000 galls.: 2,000,000, 3,000,000 and 6,000,000 Worthington comp. cond.; 5,000,000 Gordon & Maxwell comp. cond. Bituminous slack used; av. cost, 80 cts. per short ton. FILTERS.—Cap., 5,000,000 galls. Jewell; gravity. RESERVOIR.—Cap., 22,000,000 galls.; storage. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 33½ miles. Taps, 2,269; made by works, free. Services, galv. i. or lead; paid for by works to curb, when property owner guarantees rate for three years. Meters: 705; nearly all owned by works; controlled and repaired by works. Owners can compel use of meters and any consumer may have one by paying for it. Hydrants, public, 193. CONSUMPTION.—(Galls.) av., 1,200,000. PRESSURE.—Ordinary, 30 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, $175,000. No debt. Revenue: City, fire protection, $9,000; street sprinkling, $2,000. MANAGEMENT.—Mgr., Wm. B. Bull; Secy., C. R. Henderson; Supt., D. R. Gwinn; Ch. Pump. Engr., Fred Bundies. Rept. by Mgr., June 7, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 30, '82; Jewell filters, May 28, '96.

163. **RANTOUL**, Champaign Co. (1,074.) Built in '93 by village; put in operation Aug. 1. Engrs. and Contrs., J. W. Mowett & A. Unsicker, Delavan. SUPPLY.—One 8-in. well, 135 ft. deep, pumping to tank. PUMP.—Cap. 150,000 galls.; Cook deep-well. Bituminous pea coal used; av. cost, $1.37 per short ton. TANK.—Cap., 19,500 galls.; wood, on 45-ft. wooden trestle. FISCAL YEAR CLOSED Apr. 21. DISTRIBUTION.—Mains, 5 miles; cost extensions met by public funds. Taps, 400; made by village, free. Services, galv. i.; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 52,000; max., 80,000; min., 25,000. PRESSURE.—Ordinary, 20 lbs.; fire, 45 lbs. FINANCIAL.—Bonded debt, $2,000 at 6%; due $500 yearly. Expenses: Operating, $700; int., $120. Revenue, $1,200. Deficits met by taxation. MANAGEMENT.—Secy., E. V. More; Supt., O. E. Williams; Ch. Pump. Engr., O. T. Olson. Rept. by Secy., July 14, '96. SEWERS.—Has sanitary and storm sewers.

164. **RIVER FOREST JUNCTION** (P. O. Oak Park), Cook Co. (Not given.) Built in '93 by village; put in operation May 1. Engr. and Contr., Geo. C. Morgan, Chicago. No legal difficulties. SUPPLY.—Artesian well, 1,000 ft. deep, pumping by air-lift to collecting reservoir and repumping to tank and direct. PUMPS.—Blake, Worthington, and Ingersoll-Sergeant air-lift plant. Bituminous coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 70,000 galls.; collecting. TANK.—Cap., 42,000 galls.; 12 × 107 ft., on 47-ft. brick tower. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 16 miles; cost extensions met by special assessment. Taps, 200; made by village for $7 and $15. Services, ¾-in. lead; paid for by consumer. Meters: 15; owned by consumer; controlled and repaired by village. Use of meters optional with consumer. Hydrants, public, 100. CONSUMPTION.—(Galls.) av., 95,000; max., 226,000; min., 39,000. PRESSURE.—Ordinary, 30 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $85,000. Expenses, Operating, $2,300. Revenue: Consumers, unmetered, $2,968; metered, $62; other purposes, $310. MANAGEMENT.—Prest. of village, Thos. M. Jackson; Supt. and Ch. Pump. Engr., E. Micklish. Rept. by Vill. Clk., Geo. W. Shearburn, June 22, '96. SEWERS.—Has sanitary and storm sewers.

165. **RIVERSIDE**, Cook Co. (Est., 1,100.) Built in '70 by village. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 1,750,000 galls.: 2—875,000 Worthington, a 6-in. cylinder triple exp. and a comp. non-cond. Air-lift, installed May, '96; with compressor, 12 × 16-in. Rand. Repts. by makers. TANK.—Cap., 42,000 galls.; 12 × 50 ft., on 60-ft. brick tower. FINANCIAL.—Cost, $25,000. Bonded debt, $5,000. MANAGEMENT.—Chn. Water Board, Dan. E. Richardson. PROJECTED IMPROVEMENTS.—Plant is being remodeled at this time (June 22, '96). NOTE Above information is that given in '90 Manual.

166. **ROCHELLE**, Ogle Co. (1,789.) Built in '77 by village. SUPPLY.—Spring, pumping direct and to tank. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington simple high pressure. TANK.—Cap., 83,844 galls.; 12 × 40 ft., on 70-ft. brick tower. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 3¾ miles. Taps, about 190. Hydrants, public, 50. CONSUMPTION.—(Galls) av., unknown. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $30,000. No debt in '90. Revenue, Consumers, $1,300. MANAGEMENT.—Supt. and Engr., Frank J. Hannagan. Rept. by Francis E. Dream. REFERENCE.—Eng. News, June 17, '82.

181. **ROCK FALLS**, Whiteside Co. (1,900.) See Sterling.

167. **ROCKFORD**, Winnebago Co. (23,584.) Built in '74-5 by city. SUPPLY.—Nine artesian wells, five from 1,200 to 2,000 ft. deep, four 400 ft. deep, flowing to reservoir and pumping to same and direct. PUMPS.—Cap., 11,000,000 galls.; two Holly-Gaskill hor. high duty, 6,000,000 and 3,000,000; 2,000,000 Holly quadruplex. Makers rept. air-lift; compressor, 12 × 16-in. Rand. Bituminous screenings used; av. cost, $1.57 per short ton. RESERVOIR.—Cap., 1,100,000 galls.; covered. FISCAL YEAR CLOSED DEC. 31, '95. DISTRIBUTION.—Mains, 54 miles; cost extensions met by appropriations. Taps, about 2,800; made by city at $16.50 for ¾-in. and $20 for 1-in. Services, lead; paid for by property owner. Meters: 40; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city; compulsory for large consumers. Hydrants, public, 366; private, 6. CONSUMPTION.—(Galls.) av., 2,958,721; max., 3,600,000; min., 2,500,000. PRESSURE.—Ordinary, 45 lbs.; fire, 90 to 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $544,492. Bonded debt, $107,600, at 4½%, due at different times during next 12 yrs. Expenses, Operating, $19,908. Revenue: Consumers, unmetered, $30,738; metered, $1,200. MANAGEMENT.—Chn. Com. on Fire & Water, W. M. Kimball. Rept. by Supt. Chas. E. Stowell, June 5, '96. PROJECTED IMPROVEMENTS.—Jan. 18, '97, Chas. C. Stowell, Cy. Engr., rept. council had just voted to contract with D. W. Mead, of Rockford, to secure supply of 6,000,000 galls. per day for about $52,000. Shaft is to be sunk and pumps placed at least 80 ft. from surface. Tunnel is to connect with present wells, and additional ones are to be sunk if necessary. Machinery to be in duplicate and to deliver water to either pump-well or reservoir, as desired. To be completed by June 1, '97. SEWERS.—Has partial systems of sanitary and storm sewers. REFERENCES.—Covered reservoir, Eng. News, Feb. 22, '94, illus.; tests of Pohle air-lift pumps, Mar. 4, '97.

168. **ROCK ISLAND**, Rock Island Co. (13,634.) Built in '71-2 by city. SUPPLY.—Mississippi River, pumping direct. PUMPS.—Cap., 8,000,000 galls.; 5,000,000 Holly-

Gaskill hor. high duty; 3,000,000 Holly quadruplex; (Makers rept. 5,000,000 Deane comp. dup. furnished in '90.) Bituminous slack used; av. cost, $1 per short ton. FILTERS.—Cap., 2,000,000 galls.; Jewell. DISTRIBUTION.—Mains, 30 miles; cost extensions met by appropriations. Taps, 2,000; made by consumer, no fee. Services, lead; paid for by property owner. Meters, 6; owned, controlled and repaired by city. Use of meters compulsory for R. Rs. City can compel use of meters and any consumer may have one. Hydrants, public, 186; private, 20. CONSUMPTION.—(Galls.) av., 3,500,000; max., 4,000,000; min., 2,500,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost (in '88), $285,000. Bonded debt, $25,000, at 5%. Expenses: Operating, $12,000. Revenue, Consumers, $25,000. MANAGEMENT.—Comrs. Ch. Pump. Engr., T. J. Reddig. Rept. by Supt., Ezra Wilcher, Sept. 28, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Mar. 17, '88; Jewell filters, May 28, '96.

87. **ROGERS PARK,** Cook Co. Now part of Chicago, but supplied by private works. See Chicago.

169. **ROSEVILLE,** Warren Co. (788.) Built in '94-5 by village for general supply. Engr., Chas. F. Sturtevant, St. Louis. SUPPLY.—Well, pumping to stand-pipe. FINANCIAL.—Cost, $5,000. MANAGEMENT.—Rept. by Vill. Clk., June 22, '96.

170. **ROSSVILLE,** Vermilion Co. (879.) Built in '95 by city; put in operation in July. Contrs., S. W. Straw & Co., Danville. SUPPLY.—Deep well, pumping to stand-pipe and reservoir. PUMPS.—American deep well. RESERVOIR.—Cap., 100,000 galls. STAND-PIPE.—Cap., 49,000 galls.; steel; 10 × 85 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 2 miles; cost extensions met by public funds. Taps, 55; made by village, free. Services, iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 100,000. FINANCIAL.—Cost, $7,000. Bonded debt, $6,500, at 7%. MANAGEMENT.—Rept. by Will S. Dill, June 20, '96.

171. **RUSHVILLE,** Schuyler Co. (2,031.) Built in '94 by city. Const. Engrs., Alvord & Shields, The Rookery, Chicago. Contrs. (press rept.), G. W. Dudley & Co., St. Louis. SUPPLY.—Springs, pumping to stand-pipe. First supply was from well, which proved insufficient and poor. In '96 reservoir was built to impound springs; two other springs flow into 22 × 20 ft. well. PUMPS.—Cap., 1,000,000 galls.; two Deane dup. (rept. by makers). FILTER.—Sand; water can be passed through it on its way to well. RESERVOIR.—Area, 1½ acres. STAND-PIPE.—Cap., 115,000 galls.; 14 × 100 ft. (?). DISTRIBUTION.—Mains (in '94), 8½ (?) miles. Hydrants (in '94), 18. MANAGEMENT.—Rept. by Supt. and Cy. Engr., J. A. Lawler, Jan. 18, '97, and from proposal advertisement, where queried, thus: (?).

P 16. **SAINT ANNE,** Kankakee Co. (718.) Citizen rept. in Dec., '96, that town had no works, but that A. C. Shreipe and W. A. Guertin were com. on same.

P 17. **SALEM,** Marion Co. (1,493.) Press rept., Dec. 12, '96, stated J. H. Vawter and others had been appointed com. to investigate works to be built by city. Est. cost, $30,000. Jan. 8, '97, J. F. Black, Engr., Carlyle, rept. vote on above would be taken in spring.

172. **SANDWICH,** Dekalb Co. (2,516.) Built in '83 by city. SUPPLY.—Well, 14 × 28 ft., pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 (?) galls.; Worthington. Makers also rept. a 1,000,000 Worthington comp. non-cond. STAND-PIPE.—Cap., 84,600 galls.; 12 × 100 ft., on masonry foundation. DISTRIBUTION.—Mains, 8.5 miles. Taps, 125. Meters, 1. Hydrants, public, 34. PRESSURE.—(In '89.) Ordinary, 50 lbs.; fire, 125 lbs. FINANCIAL—Cost, $30,000. Bonded debt, $5,000, at 6%. Expenses, $1,700: Operating, $1,400; int., $300. Revenue: Consumers, $1,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, May 24, 84.

173. **SAVANNA,** Carroll Co. (3,097.) Built in '86 by town. SUPPLY.—Well, on island in Mississippi River, pumping to reservoir. Artesian well was to be sunk in '91; upon its completion, island well was to be abandoned. PUMP.—Cap., 700,000 galls.; Deane. Press rept., Sept. '96, stated 1,000,000-gall. Worthington comp. pump had been added (evidently second hand). RESERVOIR.—Cap., 750,000 galls.; on elevation of 225 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 90. Hydrants, 21. CONSUMPTION.—(Galls.) av., 105,000. PRESSURE.—(In '89.) Ordinary, 80 lbs. FINANCIAL.—Cost, $26,000. Bonded debt, $15,000, at 5%. Expenses, $1,775: Operating, $1,000; int., $775. Revenue, $1,877: Consumers, $927; City, $950. NOTE.—No rept. since '90-1 Manual.

174. **SHANNON,** Carroll Co. (591.) Built in '94 by village; put in operation in Sept. Engrs., U. S. Wind Engine & Pump Co., Batavia. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Drilled well, pumping to tank. PUMPS.—22½-ft. Eclipse wind-mill on 100-ft. steel tower, operating 8¾-in. deep well pump. TANK.—Cap., 58,200 galls.; cypress, 24 × 21 ft., on 60-ft. brick tower. DISTRIBUTION.—Mains, 4,700 ft. Taps, about 40. Meters, 0. Hydrants, public, 9. FINANCIAL.—Cost, $7,500. Expenses: Operating, $50. Revenue, $150. MANAGEMENT.—Prest. of Trustees, Wm. H. Barron; Supt., J. A. Eby. Rept. by Prest. and Contrs. Dec., '96.

175. **SHEFFIELD,** Bureau Co. (993.) Built in '94 by village; put in operation in Mar. Contrs., "Challenge Wind Mill Co.," Batavia. SUPPLY.—Open well, pumping

to tank. PUMP.—Cap., 500,000 galls.; Laidlaw-Dunn-Gordon. Bituminous coal used; av. cost, $2.25 per short ton. TANK.—Cap., 62,720 galls.; wood; 23 x 20 ft., on trestle 70 ft. high. FISCAL YEAR CLOSED Apr. 29. DISTRIBUTION.—Mains, 9,400 ft.; cost extensions met by public funds. Taps, 85; made by village. Services, galv. i.; paid for by consumers. Meters, 0. Village can compel use of meters, and any consumer may have one. Hydrants, public, 22. CONSUMPTION.—(Galls.) 5,000 in winter to 22,500 in summer. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $12,000. Floating debt, $7,000, at 6%. Revenue: Consumers, $550. MANAGEMENT.—Vill. Prest., J. M. Russell; Supt. and Ch. Pump. Engr., G. H. Victor. Rept. by Fred C. Klock, July 2, '96. SEWERS.—None.

176. **SHELBYVILLE,** Shelby Co. (3,162.) Built in '85-6 by Shelbyville Water Co. SUPPLY.—Kaskaskia River, to infiltration well, thence pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington, a simple high-pressure and a comp. non-cond. STAND-PIPE.—Cap., 110,000 galls.; steel; 12½ x 130 ft. DISTRIBUTION.—Mains, 7 miles. Taps, 367. Meters, 1. Hydrants, 50. PRESSURE.—(In '88.) Ordinary, 60 lbs.; fire, 160 lbs. FINANCIAL.—Cap. Stock: Paid-up, $75,000. Bonded debt, $100,000, at 6%. Expenses: Operating and taxes, $2,000; int., $6,000. Revenue, $9,482: Consumers, $6,482; City, $3,000. NOTE.—No rept. since '90-1 Manual.

P 18. **SHELDON,** Iroquois Co. (910.) Summer of '96 town voted for works and employed J. A. Harman, Peoria, to make plans and tests. Prospecting for water was carried on through the summer. Nov., '96, M. B. Wood, Clk., rept. hoped to find water winter of '97, after which works would be built; pumping to tank. Est. cost, $10,000 to $15,000.

177. **SOMONAUK,** Dekalb Co. (468.) Built in '89-90 by village. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 80,000 galls.; double acting operated by wind-power. TANK.—Cap., 80,000 galls. DISTRIBUTION.—Mains, 1.5 miles. Taps, 25. Hydrants, 12. PRESSURE.—(In '88.) Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $7,500. Expenses, $25. NOTE.—No rept. since '90-1 Manual.

62. **SOUTH EVANSTON,** (Station A, Evanston P. O.), Cook Co. Now part of Evanston, which see.

178. **SPRINGFIELD,** Sangamon Co. (24,963.) Built in '66 by city. SUPPLY.—Filter galleries, pumping to stand-pipe. PUMPS.—Cap., 7,000,000 galls.; Worthington: 3,000,000 non-comp. non-cond.; 4,000,000 comp. cond. Bituminous lump coal used; av. cost, $1.06½ per short ton. FILTER GALLERIES.—Near Sangamon River; 2,285 ft. long, about 25 ft. below surface; about 900 ft. constructed in '88 and 900 in '89, 5 ft. wide and 4 ft. deep; 485 ft. added in '95, with (press rept.) slightly greater cross-section. Gallery connects with well 50 ft. in diam., sunk in '85 to furnish supply when river was abandoned. RESERVOIR.—Cap., 4,000,000 galls.; distributing, one mile northeast of city. STAND-PIPE.—Cap., 3,700 galls.; 3 x 70 ft. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 48½ miles; cost extensions met by city. Taps, 2,500; made by city, including service to sidewalk at $6 for ¾-in., $8 for 1-in., $11 for 1¼-in., $13 for 1½-in. and $19 for 2-in. Services, lead; paid for by property owner. Meters: 138; owned by city and consumers; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 198; private, 10. CONSUMPTION.—(Galls.) av., 3,708,566; max., 4,364,300; min., 3,322,500. PRESSURE.—Ordinary, 35 lbs.; fire, 60 lbs. Steam fire engines are used. FINANCIAL.—First cost, $450,000. Bonded debt (in '90), $450,000. Total bonded debt of city, $925,000. Expenses: Operating, about $22,000. Revenue, about $50,000 (actual, as per annual rept., $50,387): Consumers, unmetered, $22,000; metered, $26,000; taps and building permits, $2,000. MANAGEMENT.—Chn., Chas. F. Rippey; Secy. and Treas., Geo. Hofferkamp, Jr.; Supt., Peter Berriman; Ch. Pump. Engr., John Donnelly. Rept. by Supt., Sept. 28, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 25, '82.

179. **SPRING VALLEY,** Bureau Co. (3,837.) Built in (or prior to) '91 by city. SUPPLY.—By pumping. PUMPS.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers as erected in '95).

180. **STAUNTON,** Macoupin Co. (2,209.) Built in '95 by city; put in operation July 12. Engr., F. Wm. Raeder, St. Louis, Mo. Contr., Geo. Siegel, Carlinville. SUPPLY.—Impounding reservoir, pumping to tank. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. Bituminous slack used; av. cost, $0.60 per short ton. TANK.—Cap., 54,000 galls.; 16x36 ft., on 70-ft. ornamental brick tower. DISTRIBUTION.—Mains, 4 miles. Services, galv. iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 22; private, 3. FINANCIAL.—Cost, $35,000. Rept. by H. A. Fisher, Aug. 13, '96. SEWERS.—None.

181. **STERLING AND ROCK FALLS,** Whiteside Co. (Sterling, 5,824; Rock Falls, 1,900.) Built in '86 by Sterling Water Co. FRANCHISE.—25 yrs. from '86; provides for purchase of works by city in '95 and every 5 years thereafter. Rates are fixed in franchise and not subject to regulation by city. Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Press rept., Feb., '93, stated city of Sterling withheld part of $2,800 hydrant rental, claiming violation of contract in drawing water from river; also that court awarded city $500 rebate. SUPPLY.—Artesian well, 1,600 ft. deep, pumping to stand-pipe and pumping direct from Rock River in case of fire. PUMPS.—

Cap., 600,000 (?) galls.; 2—300,000 Deane comp. Bituminous coal used; av. cost, $1.75 per short ton. RESERVOIRS.—Cap., 900,000 galls.; 2—300,000 receiving wells for domestic use and 300,000 reservoir for fire purposes. STAND-PIPE.—Cap., 235,000 galls.; steel; 20 x 100 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 18 miles; cost extension met by income. Taps, 747; made by Co. for $5.25. Services, lead and galv. i.; paid for by consumer. Meters: 175; owned by consumer; controlled and repaired by Co.; yearly rental, $3. Co. can compel use of meters and any consumer may have one. Hydrants, public, 147. Co. furnishes five horse fountains and four drinking fountains, free. CONSUMPTION.—(Galls.) av., 344,297; max., 525,000; min., 300,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Authorized, $35,000; all paid-up. Bonded debt, $150,000, at 5%. Sinking Fund, none. Expenses, $13,173: Operating, $4,909; int., $7,500; taxes, $1,260. Revenue, $16,192: Consumers, unmetered, $6,699; metered, $2,077; City, fire protection, $6,795; street sprinkling, $350; sewer flushing and public buildings, free; private fire protection, $252; meter rents, $19. MANAGEMENT.—Prest., Jas. P. Baxter, Portland, Me.; Treas., R. H. Baxter, Brunswick, Me. Rept. by Secy. and Supt., Judd Decker, Oct. 30, '96. SEWERS.—Has sanitary and storm sewers.

182. **STOCKTON,** Jo Daviess Co. (379.) Under construction in '96 by village; about completed in Dec. Contrs., U. S. Wind Engine & Pump Co., Batavia. SUPPLY.—Wells, pumping to reservoir (and tank ?). PUMP.—Henion & Hubbell dup., driven by 40-HP. Atlas engine. RESERVOIR.—Cap., 100,000 galls. FINANCIAL.—Contract price, $7,-950. NOTE.—Subject to revision.

—? **STRAWN,** Livingston Co. (233.) Built since '91. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia.

183. **STREATOR,** La Salle Co. (11,414.) Built in '86-7 by Streator Aqueduct Co. FRANCHISE.—30 yrs. from '86; provides for purchase of works by city at any time. Rates are regulated by city ordinance. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Vermilion River, pumping from impounding reservoir to stand-pipe and direct. PUMPS.—Cap., 4,250,000(?) galls.: 2—1,500,000 Holly hor. rotative. Makers rept. 1,250,000 Deane dup. furnished in '96. Bituminous slack used; av. cost, $0.86 per short ton, delivered. FILTERS.—Cap., 2,700,000 galls.: Western, 1,200,000 galls.; American (New York), 1,500,000. RESERVOIR.—Cap., 300,000,000 galls. STAND-PIPE.—Cap., 294,000 galls.; steel; 20 x 125 ft. FISCAL YEAR CLOSED July 31, '95. DISTRIBUTION.—Mains, 24 miles; cost extensions met by revenue. Taps, 1,600; made by Co., free. Services, galv. i.; paid for by consumer. Meters: 120; owned by consumer; controlled and repaired by Co. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 228; private, 6. CONSUMPTION.—(Galls.) av., 1,800,000; max., 1,700,000; min., 1,000,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Withheld. In '87 cost was rept. as $275,000. MANAGEMENT.—Prest., Walter Reeves; Treas., C. L. Goodhue, Springfield, Mass.; Supt., D. E. Huggans; Ch. Pump. Engr., J. A. Huggans. Rept. by Supt., June 4, '96. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 3, '83.

—? **SULLIVAN,** Moultrie Co. (1,468.) Built in '88 by city, probably for fire protection. Supply, well, pumping with wind power to 50,000-gall. tank. Cost, about $10,-000. No debt. Rept., Mar. 5, '90. Press rept., Dec., '93, stated works to date had cost $20,000. Later press rept. stated that on Jan. 12, '97, people would vote on issuing $25,000 bonds for enlarging and extending works.

184. **SYCAMORE,** Dekalb Co. (2,987.) Built in '76 by village. SUPPLY.—Surface well, 25 x 30 ft., with four 2-in. pipes driven 35 ft. in bottom, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 (?) galls.; Blake. Makers rept. 300,000 Worthington simple high pressure. STAND-PIPE.—Cap., 179,000 galls.; 15 x 135 ft. DISTRIBUTION.—Mains, 3 miles. Taps, 100. Meters, 40. Hydrants, 36. PRESSURE.—(In '88.) Ordinary, 75 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $25,000, at 5%, due in 10, 15 and 20 yrs. Expenses, $3,300: Operating, $2,100; int., $1,200. Revenue goes to general fund of city, from which all expenses are paid. NOTE.—No official rept. since '90-1 Manual.

185. **TAYLORVILLE,** Christian Co. (2,829.) Built in '86 by town. SUPPLY.—Open, 30 x 30-ft., and tubular wells, pumping to tank and direct. PUMPS.—Cap., 3,750,-000 galls.: 3,000,000 Deane high pressure; 750,000 Holly hor. rotative. TANK.—Cap., 30,000 galls.; on brick tower. DISTRIBUTION.—Mains, 10 miles; cost extensions met by revenue. Taps, 650. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 500,000. FINANCIAL.—Cost, $30,000. Expenses: Operating, $2,500. Revenue: Consumers, $5,000. Plant is now self-supporting. MANAGEMENT.—Rept. by City Clerk, Frank Rogers, Sept. 25, '96.

186. **TOLONO,** Champaign Co. (902.) Built in '95 by city; put in operation in Aug. Engrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Drilled well, pumping to tank. PUMP.—A 8¾-in. deep well, with 8 x 24-in. vert. steam end. Bituminous pea coal used; av. cost, $1.20 per short ton. TANK.—Cap., 58,000 galls.; pine; 24 x 21 ft., on 70-ft. brick tower. DISTRIBUTION.—Mains, 2 miles. Taps, 75; made by village at consumer's expense. Services, galv. i.; paid for by consumer. Meters: 6; owned by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public,

25. CONSUMPTION.—(Galls.) av., 18,000; max., 28,000; min., 10,000. FINANCIAL.—Cost, $12,000. Bonded debt, $9,700: $4,700, at 5%; $5,000, at 6%. Expenses: Operating, $500. Revenue exceeds expenses. MANAGEMENT.—Prest., C. C. Jenkins; Clk., H. L. Groves; Supt., N. H. Stubbs. Rept. by Contrs. and Prest., Dec., '96. SEWERS.—Has storm sewers.

P 19. TOLUCA, Marshall Co. (Not given.) Press repts. state city voted for works in Sept., '95, and in Feb., '96, was about to offer $8,500 of 6% 15-yr. bonds for sale. July 30, '96, citizen rept. city was going to build.

P 20. TUSCOLA, Douglas Co. (1,897.) Bonds for well were voted in '91, and contracts let for sinking one 3,000 ft. deep. From '93 to Apr., '96, city and Contrs. were at law over depth of well. At latter date matter was compromised, and on Aug. 29, '96, attempt was being made to remove obstructions at depth of 1,480 ft. When water is secured city expects to build works. Rept. by Cy. Clk., O. B. Atherton.

P 21. UPPER ALTON, Madison Co. (1,803.) Village let contract for works in '95, but contractor was unable to go on with their construction. Aug. 3, '96, Vill. Prest., rept. city would soon advertise for bids. Engr., Geo. C. Morgan, New York Life Bldg., Chicago. Supply, driven wells, ½ mile from Mississippi River, pumping to stand-pipe. Est. cost, $53,000; partially secured.

31. URBANA, Champaign Co. (3,511.) See Champaign.

P 22. VANDALIA, Fayette Co. (2,144.) City may build in '97. Engr., Hiram Phillips, 810 Olive St., St. Louis. Nov., '94, city let contract for works to Newcomer & Hill, for $29,560, and city bought ground for pumping station, but construction was never started. Supply, Kaskaskia River. Mains, 9 miles. Rept. by Geo. Steinhauer, Oct. 28, '96.

76. VENICE, Madison Co. (932.) Sold to Granite City, Madison & Venice Water Co.; built in '89 by village. See Granite.

—? WALNUT, Bureau Co. (605.) Put under construction Sept., '96, by village. Contr., J. L. White, Walnut. SUPPLY.—Well, pumping with air-lift.(?) FINANCIAL.—Cost, $4,000 to $5,000. (Press rept. July, '96, stated $12,000 bonds had been voted.)

187. WARREN, Jo Daviess Co. (1,172.) Built in '96 by city. Engr., Preston T. Hicks. SUPPLY.—Driven well, 900 ft. deep, pumping to tank. See projected improvements. PUMPS.—Cook deep well pump, 12 in. × 24 in., × 8 in. Bituminous coal used; av. cost, $2—$2.25 per short ton. TANK.—Cap., 56,000 galls.; cypress; 20 × 24 ft., on 100-ft. stone tower. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by special assessment. Hydrants, public, 35. PRESSURE.—Ordinary, 56 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $7,200, at 5%; payable $600 per year. MANAGEMENT.—Prest., H. C. Tear; Secy., L. A. Baldwin. Rept. by Des. Engr., Aug. 22, '96. PROJECTED IMPROVEMENTS.—A 100,000-gall. collecting reservoir to be used with 750,000-gall. Worthington pump. SEWERS.—None.

F 12. WARSAW, Hancock Co. (2,721.) Built in '87 by city for fire protection. Supply, artesian well. Mains, ¾ mile. Hydrants, 8. Cost, about $2,000. Ann. op. exp., $100. No report since '89-90 Manual.

188. WASHINGTON, Tazewell Co. (1,301.) Built in '88-9 by city. SUPPLY.—Driven wells,82 ft. deep, pumping to tank. PUMPS.—Cap. not given; American deep well and Deane dup. Bituminous coal used; av. cost, $2.25 per short ton. TANK.—Cap., 25,000 galls.; iron, 11 × 36 ft., on brick tower 13 ft. diam. at bottom, 11 ft. 7 ins. at top and 68 ft. high. FISCAL YEAR CLOSED May 5. DISTRIBUTION.—Mains, 2¼ miles; cost extensions met by bonds. Taps, 125; made by city. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 23. PRESSURE.—Ordinary and fire, 44 lbs. FINANCIAL.—Cost, (in '90), $15,000. Bonded debt, $7,000, at 6%; due, $1,000 in '97 and yearly thereafter. No sinking fund. Revenue: Consumers, $700; street sprinkling, $40. MANAGEMENT.—Rept. by City Clk., Chas. Koker, July 10, '96.

P 23. WATERLOO, Monroe Co. (1,860.) Reservoir for impounding springs was built and plans for balance of works made in '96; to be owned by city. Engr., Hiram Phillips, St. Louis. Direct pressure proposed, with stand-pipe later. Est. cost, $20,000. Report by Mayor, Geo. W. Zubold, Dec. 12, '96.

189. WATERMAN, Dekalb Co. (351.) Built in '95 by Waterman Water Supply Co., Ltd.; put in operation June 28. FRANCHISE.—99 yrs. from '95. No compensation for public service. SUPPLY.—Driven well, pumping to tank. PUMP.—Cap., 16,000 galls.; operated by gasoline engine. TANK.—Cap., 8,000 galls.; on wooden tower. DISTRIBUTION.—Mains, "less than one mile." Cost extensions met by stockholders. Meters, 0. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 2,000. FINANCIAL.—Cost, $1,200. Cap. Stock, $2,000. Floating debt, $175. Expenses: Operating, about $25. Rept., Jan. 6, '97.

190. WATSEKA, Iroquois Co. (2,017.) Built in '92 by city. SUPPLY.—Pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Deane dup. (rept. by makers). STAND-PIPE.—Steel, 100 ft. high. NOTE.—Subject to revision.

191. WAUKEGAN, Lake Co. (4,915.) Built in '74 by city. SUPPLY.—Lake Michigan, pumping direct. Former artesian well supply abandoned in '94 because of insufficiency. PUMPS.—Cap., 4,500,000 galls.; 2—250,000 Deane dup. comp. cond. DISTRI-

BUTION.—Mains, 22½ miles; cost extensions met by special assessment. Hydrants, public, 171. FINANCIAL.—Cost, $100,000, including old mains and hydrants. No debt. Revenue, $10,500. MANAGEMENT.—City Council. Mayor, Edw. P. De Wolf. Rept. by City Clk., Robt. B. Conolly, Sept. 28, '96. REFERENCE.—Eng. News, Jan. 21, '82.

192. **WAYNESVILLE,** Dewitt Co. (368.) Built in '95 by city; put in operation in Apr. SUPPLY.—6-in. tubular wells, 151 ft. deep, pumping to reservoir and to tank. PUMP.—Cap., about 20,000 galls.; Cook deep well. Bituminous coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 30,000 galls. TANK.—Cypress, on 63-ft. steel tower. DISTRIBUTION.—Mains, 5,000 ft.; cost extensions met by taxation. Taps, 15; made by city. Services, ¾-in. pipe; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 3; private, 1. CONSUMPTION.—(Galls.) av., 5,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $5,000. Bonded debt, $1,700, at 7%; due May, 1897. Expenses: Operating, $200. Deficits met by taxation. MANAGEMENT.—Secy., Matthew Connell; Ch. Pump. Engr., M. L. Gainby. Rept. by J. F. Dix, Water-Wks. Comr., July 2, '96. SEWERS.—None.

193. **WENONA,** Marshall Co. (1,053.) Built in '96-7 by city. Engr., Geo. C. Morgan, New York Life Bldg., Chicago. SUPPLY.—Artesian well, 1,857 ft. deep, pumping to tank. PUMP.—Cap., 216,000 galls.; Downie deep well. Bituminous slack used; av. cost, 75 cts. per short ton. TANK.—Cap., 36,000 galls.; steel; diam. 11 ft. 10 ins. at bottom, and 10 ft. 10 ins. at top × 48 ft. high, on brick tower, 68 ft. high. DISTRIBUTION.—Mains, 2,000 ft.; cost extensions met by assessment. Taps, 10. Meters, 0. Hydrants, public, 4. PRESSURE.—Ordinary, 53 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $7,700, at 6%. Expenses: Operating, $450. MANAGEMENT.—Rept. by Jno. T. Judd, March 4, 97. SEWERS.—None.

194. **WEST CHICAGO,** Dupage Co. (Not given.) Built in '96 by village; put in operation Sept. 1. Engr., Jas. H. Thompson. Contrs., Saml. I. Pope Co., Chicago. SUPPLY.—Well, pumping to small receiving reservoir, thence repumped to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Deane dup. (rept. by makers as furnished in '96). Also deep-well pump (?). STAND-PIPE.—Cap., 170,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 42. Hydrants, 44. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $12,000, at 5%. MANAGEMENT.—Supt., S. H. Wolfe. Rept. by Vill. Prest., W. T. Reed, Jan. 22, '97.

195. **WEST DUNDEE** (P. O. Dundee), Kane Co. (873.) Built in '95 by village; put in operation May 1. Engr., D. W. Mead; Contrs., Rockford Const'n Co., all of Rockford. No legal difficulties. SUPPLY.—Springs, 3,000 ft. from, and 55 ft. above plant, pumping to stand-pipe and direct. PUMPS.—Cap., not given; two triplex Deming, operated by two Otto gasoline engines. A hydraulic ram is used for domestic purposes, and the engines and pumps in case of fire. STAND-PIPE.—Cap., 47,000 galls.; steel; 20 × 20 ft., on 30-ft. tower. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 5 miles. Taps, 150; made by consumer. Services, paid for by consumer. Meters: 8; owned by consumer; controlled and repaired by village. Village can compel the use of meters and any consumer may have one. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 50,000; max., 100,000; min., 20,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $25,000, at 6%. Expenses: Operating, $900. Revenue: Street sprinkling, $50; other purposes, $1,080. Deficits met by special assessment. MANAGEMENT.—Rept. by Supt., L. J. Schroder, Sept. 11, '96. SEWERS.—None.

196. **WESTERN SPRINGS,** Cook Co. (451.) Built in '93 by village; put in operation about June. Engr., C. Philbrick. Contrs., McRitchie & Nichols, Chicago. SUPPLY.—Four wells, pumping to tank. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Blake. Bituminous screenings used; av. cost, $1.60 per short ton. TANK.—Steel, on 100-ft. masonry tower. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains: Cost extensions met by property owners. Taps, 112; made by village at $7.50 for ⅝-in., $8.50 for ¾-in. and $12.50 for 1-in. Services, lead; paid for by property owner. Hydrants, public, 75. CONSUMPTION.—(Galls.) Max., 175,000; min., 100,000. PRESSURE.—Ordinary, 51 lbs.; fire, 80 to 90 lbs. FINANCIAL.—Cost, about $90,000. MANAGEMENT.—Ch. Pump. Engr., A. J. Jones. Rept. by F. A. Johnson, Oct. 31, '96. SEWERS.—Has sanitary and storm sewers.

197. **WHEATON,** Dupage Co. (1,622.) Built in '95 by city; put in operation in May. Alvord & Shields, The Rookery, Chicago, rept. they designed works for this place in '94. No. Contr. SUPPLY.—One 10-in. well, 178 ft. deep, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; deep well. Av. cost of coal used, $2.65 per short ton. STAND-PIPE.—Cap., 144,000 galls.; steel; 14 × 125 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 9½ miles; cost extensions met by special assessment. Taps, 148; made by city for $10. Services, lead; paid for by consumer. Meters: 50; owned by consumer; controlled and repaired by city. Use of meters can be compelled by Co. Hydrants, public, 100; private 2. CONSUMPTION.—(Galls.) av., 65,000; max., 90,000; min., 40,000. PRESSURE.—Ordinary, 54 lbs.; fire, 140 lbs. FINANCIAL.—Bonded debt, $10,000, at 5%; due in 10 yrs. Expenses: Operating, $550. Revenue: Consumers, not given; other purposes, $809. MANAGEMENT.—Prest., J. S. Peironnet; Ch. Pump. Engr., A. N. Hills. Rept. by Prest., July 28, '96. SEWERS.—Has sanitary and storm sewers.

198. **WILMETTE,** Cook Co. (1,458.) Built in '92-3 by town. Engrs., Hill & Enricht, Journal of Commerce Bldg., Chicago. Contr., I. W. Newcomer. SUPPLY.—Evanston works, through meters, at 8 cts. per 1,000 galls.; 10-yr. contract with about 7 yrs. to run. DISTRIBUTION.—Mains, 25 miles. Taps, 200; made by village for $1.25. Services, lead; paid for by property owner. Meters: 20; owned and repairs paid by property owner; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 225. CONSUMPTION.—(Galls.) av., 125,000. MANAGEMENT.—Prest., Horace G. Drury; Secy., Edw. P. Fatch; Supt., Wm. M. McCanney. Rept. by Prest., Dec. 12, '96. SEWERS.—Has sanitary sewers only.

—? **WILMINGTON,** Will Co. (1,576.) Supply, Kankakee River, pumping direct. Cost, $10,000.

199. **WINNETKA,** Cook Co. (1,079.) Built in '93 by village; put in operation in Oct. Engr., W. S. Mac Harg, Chicago. Contr., Jas. Wigginton, Evanston. Also supplies village of Glencoe, through 2—4-in. meters, about 30,000 galls. daily. SUPPLY. Lake Michigan, pumping to tank. Intake, 12-in. c. i., about 1,300 ft. long. PUMPS.—Cap., 1,600,000; 2—800,000 Worthington simple high-pressure. Anthracite coal used; av. cost, $5 per short ton. TANK.—Cap., not given; steel: enclosed by octagonal brick tower. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 17.3 miles; cost extensions met by special assessment. Taps, 260; made by village for $4.50 to $6.50. Services, lead; paid for by owner or consumer. Meters: 34; owned and repaired by consumer; controlled by village. Use of meters compulsory for restaurants, drug stores and large lawns. Village can compel use of meters and any consumer may have one. Hydrants, public, 185. CONSUMPTION.—(Galls., including Glencoe) av., 130,000; max., 245,000; min., 65,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $103,000. Expenses: Operating, $3,713. Revenue: Consumers, $3,339, of which $613 was from Glencoe. MANAGEMENT.—Chn., Jas. G. Weart, Ch. Pump. Engr., Jas. Hyland. Rept. by Supt. of Pub. Wks., F. H. Eno, Aug. 19, '96. SEWERS.—Has 12 miles of combined sanitary and storm sewers.

200. **WOODSTOCK,** McHenry Co. (1,683.) Built in '95 by city. Contrs., Saml. I. Pope Co., Chicago. SUPPLY.—Pumping to stand-pipe. DISTRIBUTION.—Mains, 3½ miles. Hydrants, 41. FINANCIAL.—Cost, pipe system contract, $14,658. NOTE.—Subject to revision.

201. **YORKVILLE AND BRISTOL,** Kendall Co. (Yorkville, 375; Bristol, not given.) Built in '87 by village. Villages lie on opposite sides of Fox River. SUPPLY.—Springs, 1½ miles from village by gravity and driven well, pumping by wind-mill. RESERVOIR.—(In '89.) Cap., 800,000 galls. FISCAL YEAR CLOSED April 30. DISTRIBUTION.—(In '90.) Mains, 2 miles. Taps, 48. Hydrants, 15. PRESSURE.—Ordinary, (in '89), 85 lbs. FINANCIAL.—Cost, $9,000. Bonded debt, $1,200. Expenses, $100: Revenue, $560. MANAGEMENT.—Prest., Fred Brethren. Rept. by Vill. Clk., Curtis Mason, Sept. 28, '96.

WISCONSIN.

—? **AMERY,** Polk Co. (451.) Built in '94 by village. Contrs., Fairbanks, Morse & Co. Rept. by M. A. Frissell, Sept. 1, '94. Press rept. states works cost $4,000.

1. **ANTIGO,** Langlade Co. (4,424.) Built in '90-1 by Antigo Water-Works Co.; put in operation in Feb. FRANCHISE.—30 yrs. from '90; provides for purchase of works by city after 10 yrs. and every 5 yrs. thereafter. Rates are not subject to regulation by city. Co. was exempt from local taxes for 5 yrs. City to pay $3,750 for hydrants on 5 miles of mains, additional hydrants every 500 ft. at $55 each per yr. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,750,000 galls.; 2—1,350,000 Gordon dup. Hard wood used; av. cost, $1.25 per cord, delivered. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 160; made by Co. Services, galv. i.; paid for by consumer. Meters: 1; owned by consumer. Use of meters optional with Co.; compulsory for R. R. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 125,000; max., 220,000; min., 60,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 to 90 lbs. FINANCIAL.—(In '90.) Cost, $60,000. MANAGEMENT.—Prest., H. C. Humphrey; Secy., D. M. Maxcy; Treas., W. G. Maxcy, Oshkosh; Supt., Edw. La Lande. Rept. by Treas., Oct. 5, '96. SEWERS.—None.

2. **APPLETON,** Outagamie Co. (11,869.) Built in '82 by Wiley Construction Co. FRANCHISE.—20 yrs. from '82; provides for purchase of works by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Fox River, pumping to reservoir and direct. PUMPS.—Cap., 5,250,000 (?) galls.: 2—1,500,000 Deane (water-power?); 2,250,000 Gordon (rept. by makers as added in '93). Bituminous coal used; av. cost, $3.75 per short ton. FILTERS.—Cap., 1,500,000 galls.; Jewell. RESERVOIR.—Cap., 2,500,000 galls.; storage; 60 ft. above and 300 ft. from pumps. DISTRIBUTION.—Mains, 32 miles; cost extensions met by revenue. Taps, made by Co., free. Services, galv. i. and lead; paid for by Co. to curb. Meters: 40: owned and repaired by consumer; controlled by Co. Use of meters compulsory for manufacturers. Co. can compel the use

of meters and consumers may usually have them. Hydrants, public, 234. CONSUMPTION.—(Galls.) av., 1,100,000; max., 1,500,000; min., 700,000. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Revenue, $8,000. MANAGEMENT.—Prest., C. H. Venner, Boston; Secy., J. A. Hawes; Ch. Pump. Engr., John H. Hayes. Rept. by Ch. Pump. Eng., Sept. 29, '96. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 8, '84.

3. **ASHLAND,** Ashland Co. (9,956.) Built in '84-5 by Ashland Water Co. FRANCHISE.—50 yrs. SUPPLY.—Chequamegon Bay, Lake Superior, pumping direct. PUMPS.—Cap., 7,000,000 galls.; 2—1,500,000 Holly-Gaskill hor. high duty and 4,000,000 Deane dup. comp. cond. FILTER BEDS.—Sand; covered; in three compartments; area, about ½ acre. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 25 miles. Taps, 1,215; made by Co. for $3.25. Services, galv. l.; paid for by Co. to street line. Meters: 93; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co.; compulsory for R. Rs., hotels, manufacturers and stables. Hydrants, public, 216; private, 4. CONSUMPTION.—(Galls.) av., 1,350,000. PRESSURE.—Ordinary, 55 to 60 lbs.; fire, 115 to 125 lbs. FINANCIAL.—Cost, $591,809. Cap. Stock: Paid-up, $175,000. Pref'd, authorized: Paid-up, $125,000. Bonded debt, $232,000, at 6%. Sinking Fund: Invested in bonds of Co. MANAGEMENT.—Prest., Lucius H. Fuller, Putnam, Conn.; Secy., J. F. J. Mulhall; Treas., Elbert Wheeler; Supt., Sam. Wheeler; Supervising Engr., Wm. Wheeler, three last of Boston. Rept. by Super. Engr. SEWERS.—Has sanitary and storm sewers.

4. **BARABOO,** Sauk Co. (4,605.) Built in '86-7 by Baraboo City Water-Works Co FRANCHISE.—20 yrs. from '87. Provides for purchase of works by city in 10 yrs. (press rept.) No legal difficulties. SUPPLY.—Springs, pumping to stand-pipe. PUMPS—Cap., 2,000,000 galls.; 2—1,000,000 Deane dup., water-power. STAND-PIPE.—Cap., 275,000 galls.; 30 × 52 ft.; base 130 ft. above town, top 250 ft. above pumps. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Hydrants, public, 106. PRESSURE.—(In '88.) Ordinary, 100 lbs.; fire, 150 lbs. FINANCIAL.—(In '88.) Cost, $130,000. Bonded debt, $150,000, at 6%. Revenue, City, fire protection, $4,340. MANAGEMENT.—Prest., G. H. Sherman; Secy. and Treas., N. P. Wardwell, both of Watertown, N. Y.; Supt., J. H. Pouley. Rept. by Treas.

—? **BARRON,** Barron Co. (829.) Built in '94 by city. SUPPLY.—Well, pumping to elevated tank. PUMP.—Cap., 1,000,000 (?) galls.; Laidlaw-Dunn-Gordon (rept. by makers).

5. **BAYFIELD,** Bayfield Co. (1,373.) Owned by town since Dec., '94. Built in '86 by Bayfield Hydraulic Co.; works have been improved and enlarged by town. SUPPLY.—Lake Superior, pumping direct and to reservoir. RESERVOIR.—(In '90.) Cap., 3,500,000 galls. DISTRIBUTION.—(In '90.) Mains, 2 miles. Taps, 60. Hydrants, 14. FINANCIAL.—Cost (in '90), $23,034; improvements cost about $22,000. Rept. by Town Clk., J. C. Boutin.

6. **BEAVER DAM,** Dodge Co. (4,222.) Built in '88 by Moffett, Hodgkins & Clarke. Press rept., Apr., '96, stated W. G. Maxcy, Oshkosh, had been appointed receiver on foreclosure to secure $125,000 of bonds. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington, a comp. non-cond. and simple high pressure. DISTRIBUTION.—(In '88.) Mains, 8 miles. Hydrants, public, 78. PRESSURE.—(In '88.) Ordinary, 45 lbs.; fire, 80 lbs. FINANCIAL.—(In '88.) Cost, $125,000. Bonded debt, $100,000, at 6%. Expenses, $7,500: Operating, $1,500; int., $6,000. Revenue, City, $3,400. NOTE.—No report since '90-1 Manual.

—? **BELMONT,** Lafayette Co. (378.) Built in '96 by village; put in operation Sept. 1. Engrs. and Contrs., Dubuque Construction Co., Dubuque, Ia. SUPPLY.—Well, pumping to tank. TANK.—Cap., 84,000 galls.; wood; 18 × 18 ft. DISTRIBUTION.—Hydrants, public, 5. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $3,000. Bonded debt, $3,000, at 5%. MANAGEMENT.—Prest., J. H. Riechers. Rept. by Vill. Clk., B. Trevarther, Nov. 16, '96. SEWERS.—None.

7. **BELOIT,** Rock Co. (6,315.) Built in '85 by Beloit Water-Works Co. FRANCHISE.—40 yrs. from '85; provides for purchase of works by city in 20 yrs. Rates are fixed in franchise. City to pay $7,500 per yr. for hydrants. No legal difficulties. SUPPLY.—Springs and driven wells, pumping to tank and direct. First well, 30 × 40 ft. PUMPS.—Cap., 4,000,000 galls.; 2—1,000,000 Smith-Valle comp. dup., for fire reserve; 2—1,000,000 Fairbanks-Morse water power. Bituminous lump coal used; av. cost, $2.25 per short ton. TANK.—Cap., 100,000 galls.; 40 × 30 ft., on 80-ft. stone tower. FISCAL YEAR CLOSED July. DISTRIBUTION.—Mains, 14 miles; cost extensions met by receipts; unsold bonds still in the treasury. Taps, 750; made by Co. Services, lead; paid for by consumer. Meters: 75; owned, controlled and repaired by Co.; yearly rental, $3. Use of meters compulsory for factories. Co. can compel use of meters, and any consumer may have one. Hydrants, public, 110; private, 20. CONSUMPTION.—(Galls.) av., 500,000; max., 900,000; min., 350,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 to 125 lbs. FINANCIAL.—Paid div'd in '95. Expenses: Operating, $3,500 to $4,000. Revenue: City, fire protection, $7,500; street sprinkling, $250; other purposes, $8,500 to $9,000. No deficits. MANAGEMENT.—Prest., E. P. Salmon. Secy., Treas. and Mgr., C. B. Salmon. Rept. by Mgr., June, '96. SEWERS.—Sanitary sewers are under construction.

8. **BERLIN,** Green Lake Co. (4,149.) Built in '96 by City Water Co.; put in operation Nov. 19. Engr., D. P. Blackstone. Contrs., W. H. Wheeler & Co., Beloit. FRANCHISE.—29 yrs. from '96. Provides for purchase of works by city at any time within six months of Nov. 19, '96, for $61,000, less amount of bonded indebtedness. (City expects to do so.) Max. rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $4,500 per yr. for 78 hydrants. LEGAL DIFFICULTIES.—None at time of Co.'s rept. Press rept., Jan., '97, stated taxpayers had instituted proceedings to test validity of franchise. SUPPLY.—Two flowing artesian wells, pumping from collecting to distributing reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Laidlaw-Dunn-Gordon comp. dup. direct-acting. Wood used. RESERVOIRS.—Cap., 300,000 galls.: Collecting, 100,000; distributing, 200,000, at elev. of 134 ft. DISTRIBUTION.—Mains, 9 miles. Hydrants, public, 78. PRESSURE.—Ordinary, 55 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $61,000. Cap. Stock: Authorized, $5,000; all paid-up. Bonded debt, $60,000, at 6%; due in 1924 or earlier at option of Co. Rental of all public hydrants pledged to trustees for payment of int., and principal as fast as possible; the same will pay all bonds before maturity. MANAGEMENT.—Prest., W. H. Wheeler, Beloit; Secy., Geo. M. Allen; Treas., C. E. Wheeler, Beloit.

9. **BLACK RIVER FALLS,** Jackson Co. (2,261.) Built in '86-7 by town. SUPPLY.—Driven wells, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Gordon-Maxwell. dup. Wood used. STAND-PIPE.—Cap., 150,000 galls.; 16 x 100 ft. FISCAL YEAR CLOSED Jan., '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by water-works fund. Taps, 250; made by city for $1. Services, galv. i.; paid for by consumer. Meters: 35; owned and repaired by consumer; controlled by city. Use of meters optional with consumer; compulsory for manufacturers. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 50,000; max., 125,000; min., 40,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $28,000. Bonded debt, $15,000, at 5%; due in '96. Expenses: Operating, $1,200. Revenue: Consumers, unmetered, $1,750; metered, $300. MANAGEMENT.—Supt. and Ch. Pump. Engr., E. J. Greenlee, Rept. by Supt., Aug. 17, '96. SEWERS.—Has storm sewers only.

F 1. **BLOOMER,** Chippewa Co. (631.) Built in '96 by village, for fire protection only. Engrs., A. L. Bogart, Eau Claire, and C. L. Christianson. Contrs., Matthew Wilson. Supply, pumping direct with Holly rotary water-power. Mains, 1½ miles; cost extensions met by tax levy. Hydrants, public, 6. Pressure, 80 to 120 lbs. Cost, $7,000. Floating debt, $4,500, at 5%. Expenses, $250: Operating, $25; int., $225. No revenue. Expenses are met by taxation. Clk., Howard Dibble. Rept. by Ch. Pump. Engr., C. L. Christianson, Dec. 14, '96. Has storm sewers only.

F 2. **BOSCOBEL,** Grant Co. (1,570.) Built in '70 by Boscobel Roller Mills, for fire protection and for supply of mills. Water passes through main street and hydrants are attached for use in case of fire. City has the use of the water for fire purposes free, in consideration of granting permission to the Co. to lay mains in the street. Supply, creek, by gravity direct. No tanks or reservoirs. Hydrants, 3. Rept. by C. W. Menkhausen, July 28.

10. **BOYD,** Chippewa Co. (545.) Built in '93 by village for general use. Contrs., U. S. Wind Engine & Pump Co. SUPPLY.—Driven well, pumping to tank. PUMP.—Curtis double-acting, with 6 x 18-in. water end. Wood used. TANK.—Cap., 37,600 galls.; 20 x 16 ft., on 50-ft. trestle. DISTRIBUTION.—Mains, 1½ miles. Hydrants, public, 6. FINANCIAL.—Cost, $6,000. Expenses: Operating, $300. MANAGEMENT.—Prest., Albert Butscher; Secy., A. E. Schultz; Treas., A. J. Chubb; Supt., John Baker; Ch. Pump. Engr., M. Lahr. Rept. by Prest., July 29, '96. SEWERS.—None.

11. **BRODHEAD,** Green Co. (1,461.) Built in '94 by city. SUPPLY.—Artesian well for domestic service; connection with river for fire purposes, pumping direct. PUMPS.—Cap., 970,000 galls. Domestic service, 250,000 Gordon; fire service, 720,000 rotary. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by taxation. Taps, 100; made by city for $2. Services, lead; paid for by consumer. City can compel the use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 3,000; max., 6,000; min., 2,000. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $14,000. No debt. Expenses: Operating, $750. Revenue: Consumers, $400. Deficits are met by taxation. MANAGEMENT.—Supt., M. H. Doty. Rept. by Supt., Sept. 6, '96. PROJECTED IMPROVEMENTS.—Another well and larger pumps.

12. **BURLINGTON,** Racine Co. (2,043.) Built in '90 by town. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Barr dup. TANK.—Cap., 30,000 galls.; 20 x 30 ft.

P 1. **CASSVILLE,** Grant Co. (886.) Bids for village works were received in '95, but they exceeded available funds ($4,500). Dec., '96, L. M. Okey, Vill. Prest., rept. an artesian well had been sunk, but nothing more would be done until spring.

13. **CENTRALIA,** Wood Co. (1,435.) Built in '94 by city; put in operation Sept. 1. Contrs., Fairbanks, Morse & Co., St. Paul, Minn. SUPPLY.—Well near Wisconsin River, pumping direct. PUMP.—Cap., 750,000 galls. Wood used; av. cost, $1 per load; use 1 load per day. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 3 miles. Taps, 72; made by city for $1. Services paid for by consumer. Meters, 0. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 22,500; max., 30,000; min., 15,000.

PRESSURE.—Ordinary, 50 lbs.; fire, 100-140 lbs. FINANCIAL.—Cost, $17,800. Expenses: Operating, $1,200. Revenue: Consumers, $900. MANAGEMENT.—Prest., A. L. Ridgman; Supt. and City Clerk, F. Rourck. Rept. by Ch. Pump. Engr., Fred. Pfeifer, July 28, '96. SEWERS.—None.

14. **CHIPPEWA FALLS,** Chippewa Co. (8,670.) Now owned by Chippewa Falls Water-Works & Lighting Co. Built in '85 by Moffett, Hodgkins & Clarke, Syracuse, N. Y. FRANCHISE.—30 yrs. from '86; provides for purchase of works by city at end of every 5 yrs. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Deane. Wood shavings used. STAND-PIPE.—Cap., 350,000 galls.; 25 × 100 ft. DISTRIBUTION.—Mains, 18 miles. Taps, 1,250; made by Co. for $2. Services, iron; paid for by consumer. Meters: 30; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co. Hydrants, public, 157; private, 2. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $149,000, at 6%; due 1917. MANAGEMENT.—Prest., L. C. Stanley; Secy., L. M. Newman; Supt., E. Rohan; Cashier, D. G. Coleman. Rept. by Cashier, Sept. 25, '96. SEWERS.—Has sanitary and storm sewers.

15. **CLINTON,** Rock Co. (856.) Built in '96 by village; put in operation Nov. 15. Engrs., Wheeler & Co., Beloit. Contrs., Fairbanks, Morse & Co., Chicago, Ill. No legal difficulties. SUPPLY.—Well, 450 ft. deep, pumping to elevated tank and direct. PUMP.—Fairbanks, Morse & Co., deep well. Power furnished by electric light co. TANK.—Cap., 63,000 galls.; cypress wood; 24 × 20 ft., on stone tower. DISTRIBUTION.—Mains, "nearly" 3 miles; cost extensions met by vote of village. Taps, 40; made by village for $10, including service to curb. Services, lead or iron; paid for by consumer. Meters, 6. Village can compel use of meters and any consumer may have one. Hydrants, public, 26; private, 10. PRESSURE.—Ordinary, 60 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $17,000. Expenses: Operating, $600; int., $650, taxes, none. MANAGEMENT.—Village Board. Supt., E. J. Wakeford; Ch. Pump. Engr. of Electric Light Co. (see above), H. Falts. Rept. by works, Dec. 14, '96. SEWERS.—Has storm sewers only.

16. **COLUMBUS,** Columbia Co. (1,977.) Built in '96 by city; put in operation Sept. 4. Engr., A. E. Phillips, Madison. Contrs., W. H. Wheeler & Co., Beloit. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; Smith-Vaile. Indiana block coal used; av. cost, $3.70 per short ton. RESERVOIR.—Cap., 90,000 galls.; collecting. TANK.—Cap., 70,500 galls.; steel; 20 × 30 ft., on 60-ft. brick tower. DISTRIBUTION.—Taps made by city. Services, lead; paid for by consumer. City can compel the use of meters and any consumer may have one. Hydrants, public, 32. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. One steam fire engine. FINANCIAL.—Cost, probably $25,000 to $30,000. MANAGEMENT.—Supt. and Ch. Pump. Engr., W. E. Smith. Rept. by W. H. Cook, Supt. of Const., Sept. 8, '96. SEWERS.—None.

—? **CUBA,** Grant Co. (Est., 316.) Built in '96 (press rept.). Makers rept. 8 × 12-in. Goulds pump, driven by gasoline engine.

17. **CUMBERLAND,** Barron Co. (1,219.) Built in '95 by city; put in operation July 1. Engr., C. F. Loweth, St. Paul. Contrs., except for tank, Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, 1,500 ft. deep, pumping to tank. PUMP.—Cap., 800,000 galls.; Fairbanks, Morse & Co. Wood used. TANK.—Cap., 72,000 galls.; wood; on steel trestle, 84 ft. high. DISTRIBUTION.—Mains, 1.4 miles. Taps, 64; made by consumer, no fee. Services, ¾-in. w. l.; paid for by property owner. Meters, 0. Hydrants, public, 15. FINANCIAL.—Cost, $14,000. Bonded debt, $6,600, at 6%; due in 10 yrs. Expenses: Operating, $360. Works are more than self-supporting. MANAGEMENT.—Clk., G. E. Carr; Ch. Pump. Engr., John Hunter. Rept. by August Wolff, Nov. 15, '96. SEWERS.—None.

18. **DARLINGTON,** La Fayette Co. (1,589.) Built in '86-7 by town. SUPPLY.—Well, pumping to reservoir. PUMP.—Cap., 230,000 galls.; Smedley. RESERVOIR.—Cap., 115,000 galls.; press rept., July, '96, stated "the arches over the reservoir are being built" (perhaps a new and larger reservoir). DISTRIBUTION.—Mains, 3.5 miles. Taps, 118. Meters, 4. Hydrants, 20. PRESSURE.—(In '88.) Ordinary, 65 lbs.; fire, 65 to 100 lbs. FINANCIAL.—Cost, $17,000. Bonded debt, $15,000 at 5%, due in ann. payments of $1,000 after '92. Expenses, $1,150; operating, $400; int., $750. Revenue, Consumers, $1,200. NOTE.—No report since '90-1 Manual.

19. **DEERFIELD,** Dane Co. (338.) Built in '95 by village for general use. SUPPLY.—Wells, pumping to tank. PUMP.—Driven by 9-HP. Otto gasoline engine (rept. by maker). RESERVOIR.—On natural elev. of 90 ft. TANK.—On 40-ft. brick tower. FINANCIAL.—Cost, $5,000. MANAGEMENT.—Vill. Council. Rept. by H. E. Jones, Oct., '96.

20. **DELAVAN,** Walworth Co. (2,088.) Built in '93 by Village. Engrs. or Contrs., Fairbanks, Morse & Co., Chicago. FINANCIAL.—(Press rept., May, '96). Operating, $1,698. Revenue, $3,416.

21. **DE PERE,** Brown Co. (3,625.) Owned by Artesian Water Supply Co. Built in '88. FRANCHISE.—25 yrs. from '86. Co. is not exempt from local taxes. City to pay $675 per yr. for public service. No legal difficulties. SUPPLY.—Artesian wells, one 6-in. and one 8-in., by natural pressure. FISCAL YEAR CLOSED Sept. 1. DISTRIBU-

TION.—Mains, 3¾ miles; cost extensions met by income. Taps, 200; made by Co. including service to curb, free. Hydrants, public, 29. PRESSURE.—(In '88.) Ordinary, 43 lbs. Steam fire engines are used. FINANCIAL.—Cost, $20,000. Cap. Stock, authorized, $30,000; paid-up, $25,000; paid $600 div'd in '95. Expenses: Operating, $437; taxes, $187. Revenue, $2,443: Consumers, $1,564; City, fire protection, $642; street sprinkling, $50. MANAGEMENT.—Prest., A. G. Wells; Secy., E. W. Lawton; Treas. and Supt., Robt. Jackson. Rept. by Secy., Sept. 25, '96. SEWERS.—Has sanitary sewers.

22. **DODGEVILLE,** Iowa Co. (1,722.) Built in '94 by city; tested in Dec. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Well (?), pumping to tank. PUMP.—Cap., 500,000 galls.; dup. Also a wind-mill and pump. TANK.—Cap., 54,000 galls.; 20 × 24 ft., on 60-ft. brick tower. DISTRIBUTION.—Mains, 1½ miles. Hydrants, 19. FINANCIAL.—Contract price, $11,949. NOTE.—Information from press repts. in '95; subject to revision.

F 3. **DRUMMOND,** Bayfield Co. (696.) Built by Rush-Owen Lumber Co. for fire protection only. Supply, lake, pumping with 2,000,000-gall. pump to reservoir. Mains, ¾ mile. Hydrants, 24. Pressure, 45 to 125 lbs.

F 4. **EAGLE RIVER,** Vilas Co. (1,154.) Built in '89 for fire protection only. Supply, river, pumping to stand-pipe. Est. cost, $10,000. Address Chn. Town Bd.

23. **EAU CLAIRE,** Eau Claire Co. (17,415.) Built in '85 by Eau Claire Water-Works Co. FRANCHISE.—60 yrs. from '85; provides for purchase of works by city every 5 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $54 per hydrant for first 200 and $44 for each additional one on extensions. No legal difficulties. SUPPLY.—Springs by gravity from reservoir to pump well, thence by direct pumping. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Smith-Vaile water power. RESERVOIR.—Cap., 20,000,000 galls.; at springs. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 30 miles; cost extensions met by current funds. Taps, 1,536; made by Co. for $1.50. Services, galv. i.; paid for by property owner. Meters: 184; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for large consumers. Co. can compel the use of meters and any consumer may have one at his own expense. Hydrants, public, 346; private, 50. CONSUMPTION.—(Galls.) av., 1,400,000; max., 2,000,000; min., 1,050,000. PRESSURE.—Ordinary, 70 lbs.; fire, 90 to 120 lbs. Steam fire engines are owned but not used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., O. H. Ingram; Secy., Treas. and Supt., W. H. Willards; Ch. Pump. Engr., J. M. Briggs. Rept. by Supt., June 5, '96. SEWERS.—Has sanitary and storm sewers.

F 2. **EDGERTON,** Rock Co. (1,595.) Franchise was granted to W. H. Wheeler & Co., Beloit, Apr. 10, '96. Rept. by Cy. Clk., Henry Johnson. Alvord & Shields, The Rookery, Chicago, rept. they submitted plans for works here in '96. Press rept., Dec., '96, stated franchise had not been accepted, but Co. proposed to do so and build works. Mar., '97, rept. that construction had been started, and that there would be a 120-000-gall. stand-pipe.

24. **ELKHORN,** Walworth Co. (1,447.) Built in '95 by town; put in operation Jan. 20. Engrs., Alvord & Shield, The Rookery, Chicago. Contr., Cape Reichart, Racine. SUPPLY.—Well, 1,050 ft. deep, pumping by air-lift to collecting reservoir, thence repumping to elevated tank and direct. PUMPS.—Air-lift: Cap., 275,000; Ingersoll-Sergeant compressor. Main Pump: Cap., 575,000 galls.; Deane comp. dup. Illinois bituminous coal used; av. cost, $2.60 per short ton, delivered. RESERVOIR.—Cap., 37,500 galls. TANK.—Cap., 75,000 galls.; 16 × 50 ft., on brick tower 110 ft. high. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by taxes, at present. Taps made by licensed plumber. Services, lead and iron; paid for by property owner. Meters: 12; owned and repairs paid by property owner; controlled by village. Use of meters compulsory for hotels, livery barns and laundries. Town can compel use of meters and any consumer may have one. Hydrants, public, 37. CONSUMPTION.—(Galls.) av., 18,684; max., 28,645; min., 8,723. PRESSURE.—Ordinary, 55 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $44,500. Floating debt, $20,000, at 6%. Expenses, Operating, $1,266. Revenue: Consumers, unmetered, $265; metered, $49. Deficits are met in full by taxation. MANAGEMENT.—Prest. of Board, H. C. Norris; Treas., Geo. Burpee; Supt. and Ch. Pump. Engr., Paul Prist. Rept. by Supt., Dec. 13, '96. SEWERS.—No sewers.

25. **ELROY,** Juneau Co. (1,413.) Built by city; put in operation Jan. 1. SUPPLY.—Artesian wells, pumping to reservoir. PUMPS.—Cap., 750,000 galls.; Smith-Vaile comp. dup. Wood used. RESERVOIR.—Cap., 80,000 galls. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 2 miles. Taps, 80. Meters, none. Hydrants, 14. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $6,350, at 4½%. Expenses, Operating, $600. Revenue, Consumers, $700. MANAGEMENT.—Rept. by Supt., E. S. Willey, Dec. 21, '96. SEWERS.—None.

26. **FLORENCE,** Florence Co. (444.) Built in '88 by town. Const. Engr., G. L. Taff. No Contr. SUPPLY.—Lake, pumping direct. PUMPS.—Cap., 1,600,000 galls.; 2—800,000 Knowles. DISTRIBUTION.—Mains, 1.9 miles. Taps, 70. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 to 150 lbs. FINANCIAL.—Cost, $10,000. Expenses, Operating, $1,600. Rept. by J. E. Tubbs, Jan. 18, '97.

27. **FOND DU LAC,** Fond du Lac Co. (12,024.) Built in '85 by Fond du Lac Water Co. FRANCHISE.—99 yrs. from '85 (previously rept. as 20 yrs.; 99 yrs. may be length of charter). Provides for purchase of works by city in '95 and at intervals of 5 yrs., price to be determined by arbitration. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay hydrant rental. LEGAL DIFFICULTIES. — "Regarding taxes; went to Supreme Court and beat city about 4 yrs. ago." Press rept. states decision was on two technicalities, which are chiefly of local interest. SUPPLY. — Five artesian wells, pumping direct, with storage reservoir for fire protection. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Holly-Gaskill hor. high duty. Bituminous coal used; av. cost, $3 to $3.10 per short ton. RESERVOIR.—Cap., 2,500,000 galls. DISTRIBUTION.—Mains, 18 miles; cost extensions met by bonds. Taps, 1,100; made by Co. free. Services, lead; paid for by Co. to curb. Meters: 40; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 191; private, 4. CONSUMPTION.—(Galls.) av., 960,400. PRESSURE.—Ordinary, 40 lbs.; fire, 90 to 125. FINANCIAL.—Cap. Stock: Authorized, $200,000; paid-up, $40,000. MANAGEMENT.—Prest., T. T. Flagler, Lockport, N. Y.; Treas., M. McKenna; Supt. and Ch. Pump. Engr., W. H. Masson. Rept. by Supt., June 5, '96. PROJECTED IMPROVEMENTS.—Extension of mains. SEWERS.—Has sanitary and storm sewers.

29. **FORT HOWARD** (Station A, Green Bay P. O.), Brown Co. (4,754.) Annexed to Green Bay,; supply has always been from same works.

P 8. **FOX LAKE,** Dodge Co. (814.) Petition for an election to vote on building works is being circulated for signers. Rept. by Vill. Clk., Jan. 30, '97.

—? **GALESVILLE,** Trempeleau Co. (537.) Built in '95 or '96 by Wilson Davis.

28. **GLENWOOD,** Saint Croix Co. (1,656.) Built in '91 by town; put in operation in Aug. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Creek, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Smith-Vaile dup. DISTRIBUTION.—Mains, 1½ miles. Taps made by consumer. Hydrants, public, 25. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $8,500. Bonded debt, $10,000, at 6%. Rept. by Fairbanks, Morse & Co., Jan. 1, '97. SEWERS.—No sewers.

29. **GREEN BAY,** Brown Co. (9,069.) Now owned by Green Bay Water Co. Built in '85-7 by Green Bay & Fort Howard Water-Works Co.; bought by local capitalists, Aug. 27, '96. In Apr., '95, Ft. Howard, which had been previously supplied by Co., was annexed to Green Bay. Supply is continued by Co., which has dropped "Fort Howard" from its name. FRANCHISE.—30 yrs. from '87; provides for purchase of works by city at end of 20 yrs. Co. is not exempt from local taxes. City to pay $11,437 for 275 hydrants per yr. No legal difficulties. SUPPLY.—Eight artesian wells, 930 ft. deep, flowing to reservoirs and thence pumping direct. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Knowles; one high pressure and one comp. Makers rept. air-lift plant with 12 × 16-in. Rand compressor. Youghiogheny and Hocking bituminous coal used; av. cost, $2.92 per short ton. RESERVOIRS.—Cap., 1,500,000 galls.; two impounding. FISCAL YEAR CLOSED Aug. 31. DISTRIBUTION.—Mains, 32 miles; cost extensions met by issuing stock for actual cost. Taps, 1,915; made by Co., free. Services, ¾-in. galv. i.; paid for by Co. to street line. Meters: 32; owned, 28 by Co., 4 by consumers; controlled and repaired by Co. Use of meters optional with Co. in certain cases; compulsory for factories, fish houses, laundries, livery stables and mills. Hydrants, public, 275; private, 2. CONSUMPTION.—(Galls.) av., 728,400; max., 24,565,000; min., 524,800. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $310,500. Cap. Stock: Authorized, $160,500. Bonded debt, $150,000, at 6%. Expenses: Operating, $9,861; taxes, $2,467. Revenue, $32,711: Consumers, $20,922; City, fire protection, $11,339; street sprinkling, $110; other purposes, $340. MANAGEMENT. — Prest., Wm. Larson; Secy., J. H. Tayler; Treas., Mitchell Joaness; Supt., J. F. Bertles. Rept. by Supt., Sept. 26, '96. PROJECTED IMPROVEMENTS.—New boiler and reservoir in course of construction. SEWERS.—Has sanitary and storm sewers.

P 5. **HARTFORD,** Washington Co. (1,296.) Built in '95-6 by city for fire protection. Supply, stream, lifted by 840,000-gall. Gould triplex water power pump, driven by 40-HP. wheel. Mains, 2,000 ft. Rept. by W. O. Nanscawen, Acting Mayor, Aug. 29, '96.

30. **HAYWARD,** Sawyer Co. (1,349.) Built in '87-8 by Co.; owned by city. SUPPLY.—Namakagon River, pumping direct. PUMPS.—Cap., 1,250,000 galls.; Knowles. DISTRIBUTION.—Mains, 4.7 miles. Hydrants, public, 70. PRESSURE.—(In '89.) Ordinary, 35 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $40,000. Expenses, $2,600. MANAGEMENT.—City Clk., H. P. Fuley; Treas., Hans Lorritson; Supt., De Witt Ramsdell. Rept. by City Clk., Sept. 26, '96.

31. **HIGHLAND,** Iowa Co. (751.) Built in '96 by city; put in operation Sept. 15. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Drilled well, pumping to tank. PUMP.—16-ft. steel wind-mill on 50-ft. steel tower, operating a 3¾-in. deep well cylinder. TANK.—Cap., 34,000 galls.; fir wood; 18 × 18 ft., on stone tower 20 ft. high. DISTRIBUTION.—Mains, ½ mile. Taps, 13. Meters, 0. Hydrants, public, 7. FINANCIAL.—Cost, $3,280. MANAGEMENT.—Supt., Jacob Chabb, Jr. Rept. by Mayor, Matthias Chabb, Dec., '96.

32. **HUDSON,** Saint Croix Co. (2,885.) Built in '87-8 by city. SUPPLY.—Artesian

well, pumping to reservoir. PUMP.—A 1,000,000-gall. Blake rept. in '89. Makers rept. 1,800,000 Worthington comp. non-cond.; also 8 x 10-in. Goulds pumps, driven by electric motor; these may be for pumping from wells only. RESERVOIR.—Cap., 300,000 galls.; covered with brick arches; 256 ft. above, ⅝-mile from business section. DISTRIBUTION.—Mains, 7.4 miles. Taps, 303. Meters, 0. Hydrants, public, 70. PRESSURE.—(In '89.) 90 lbs. FINANCIAL.—Cost, $58,800. Bonded debt, $24,000, at 4½%, due 1907 and '08. No Sinking Fund. Expenses, $2,000: Int., $960. Revenue, $5,000. Money for redemption of bonds raised by direct taxation. MANAGEMENT.—Supt., W. J. Johnson. Rept. by City Clk., M. Herrick, Sept. 26, '96.

33. **HURLEY AND IRONWOOD** (P. O. for Ironwood, Loveland), Iron and Barron Cos. (Hurley, 2,267; Ironwood, not given.) Now operated by Hurley Water Co.; built in '87-8 by Gogebic Water & Gas Supply Co.; afterwards operated by Northwestern Water & Gas Supply Co., Minneapolis. FRANCHISE.—30 yrs. City to pay $100 each per yr. for first 50 hydrants; $75 each for second 50; $50 for each additional. SUPPLY.—Montreal River, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; 750,000 Worthington dup. simple high-pressure.; 1,000,000 Barr comp. dup. STAND-PIPE.—Cap., 264,000 galls.; iron; 30 x 50 ft. DISTRIBUTION.—Mains, 3 miles. Taps, 95. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $175,000. Cap. Stock, $200,000. Bonded debt, $250,000 authorized, $150,000 issued. Expenses: Operating, $4,800. Revenue: Consumers, $12,500; City, $9,250. NOTE.—No rept. since '90-1 Manual.

34. **INDEPENDENCE**, Trempealeau Co. (382.) Built by village; put in operation in Jan., '96. Engr., Ferd. H. Pickles, Winona, Minn. Contr., A. J. Bautch. SUPPLY.—Artesian well, 438 ft. deep, pumping to distributing reservoir. PUMPS.—Makers rept. 750,000 Laidlaw-Dunn-Gordon as furnished in '92, which was 3 yrs. before works were put in operation. Wood used as fuel. RESERVOIR.—Cap., 100,000 galls.; 173 ft. above street level. DISTRIBUTION.—Mains, 4,850 ft; cost extensions met by village funds. Taps, 18; made by licensed plumber. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 2,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, about $8,200. Bonded debt, $3,000, at 6%, due in 1900. Expenses: Operating, $200; int., $180. MANAGEMENT.—Prest., A. Garthus. Rept. by Clerk, J. Jackson, Jan. 7, '97. SEWERS.—No sewers.

35. **IRON RIVER**, Bayfield Co. (Not given.) Built in '92-3 by Iron River Water, Light & Power Co. Engrs. and Contrs., Robt. Bement & Co., St. Paul, Minn.; put in operation Jan. 7, '93. SUPPLY.—Iron River, pumping direct. PUMPS.—Cap., 1,375,000 galls.; Blake; 1,250,000 dup. fire and 125,000 single acting. DISTRIBUTION.—Mains, 1.9 miles. Services, lead and galv. i. Hydrants, public, 25. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. MANAGEMENT.—Rept. by Robt. Bement & Co., Jan. 26, '93. Jan. 5, '97, citizen wrote to address Byron Ripley for information.

33. **IRONWOOD** (P. O. Loveland), Barron Co. See Hurley.

36. **JANESVILLE**, Rock Co. (10,836.) Built in '87-8 by Janesville Water Co. Press rept., Dec., '96, state people voted against bonds for purchase of works by city. LEGAL DIFFICULTIES.—City sought to annul franchise, chief allegation being misrepresentation of cost of plant when city was considering purchase. Supreme Court refused to allow Attorney General to institute quo warranto proceedings. Later, Co. and city appointed arbitrators, who found substantial agreement between books of Co. and a later rept. on cost, much lower than the first one, made by Co. (Press repts.). SUPPLY.—Two artesian wells and an auxiliary fire well, pumping to stand-pipe and direct. First well, 8-in. x 1,087 ft. PUMPS.—Cap., 4,000,000 galls.; Blake comp. cond. RESERVOIR.—Cap., 800,000 galls. STAND-PIPE.—Cap., 300,000 galls.; iron; 25 x 85 ft., on hill 100 ft. above pump house. DISTRIBUTION.—Mains, 26 miles. Hydrants, public, 240. PRESSURE.—Ordinary, 75 lbs.; fire, 125 lbs. FINANCIAL.—(In '90.) Cap. Stock, $200,000. Bonded debt, $164,000 at 6%. MANAGEMENT.—Prest., W. G. Marcy; Secy. and Supt., E. M. Hyzer; Treas., C. S. Jackman. Rept. by Supt., Sept. 25, '96. REFERENCE.—Description of artesian well, etc., Eng. News, July 20, '89, illus.

—? **JOHNSON CREEK**, Jefferson Co. (176.) Fairbanks, Morse & Co., Chicago, rept. that there are works here; no response to inquiries.

37. **JUNEAU**, Dodge Co. (701.) Built in '95 by city; put in operation in Aug. Engrs. and Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 200,000 galls.; Goulds, driven by 6-HP. Otto gasoline engine. TANK.—Cap., 58,200 galls.; pine, 24 x 21 ft., on 70-ft. brick tower. DISTRIBUTION.—Mains, 2 miles. Taps, about 60. Meters, 1. Hydrants, public, 17. FINANCIAL.—Cost, about $9,000. Expenses: Operating, $250. Revenue, $350. MANAGEMENT.—Supt. John Hildeman. Rept. by Mayor, W. E. Hallock, Dec., '96.

P 4. **KAUKAUNA**, Outagamie Co. (4,667.) City granted franchise in '95 which provided for bond issue by city to cover part of cost of plant and eventual city ownership. About Nov., '96, Supreme Court declared franchise void, because bonds would create debt in excess of limit. Early in '97 propositions for a franchise were received from Wheeler & Co. (Beloit?); Milwaukee Construction Co.; and Wells, Reichert & Co., Racine, the original grantees. Franchise granted to latter, but rept. that Mayor would veto it. Above from press repts.

38. **KENOSHA,** Kenosha Co. (6,532.) Owned by city; built in '78-9 by Park City Water Co. City bought this plant and that of the North Side Water Co. and combined them with a new plant Aug. 21, '95. Engr., of new system, J. B. Davidson. Contrs., W. H. Wheeler & Co., Beloit. FRANCHISE.—Exclusive, 20 yrs. Rates not subject to regulation by city. SUPPLY.—Lake Michigan, by pumping. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Gordon comp. cond. dup. Indiana block coal used; av. cost, $2.60 per short ton. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 15.4 miles; cost extensions met by appropriation from general tax levy. Taps, 690; made by city. Services, lead; paid for by consumer. Meters, 10. owned by consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 150. CONSUMPTION.—(Galls.) max., 810,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $160,000. Bonded debt, $127,000, at 5%; due 1915. Expenses: Operating, est., $4,100. Revenue: Consumers, unmetered, est., $11,900; metered, est., $300. Deficits are all met by taxation. MANAGEMENT.—Ch. Pump. Engr., H. R. Cumistrey. Rept. by Supt., J. B. Davidson, July 6, '96. SEWERS.—Has sanitary and storm sekers. REFERENCE.—Eng. News, Mar. 4, '82.

39. **KILBOURN CITY,** Columbia Co. (961.) Built in '89-90 by village. SUPPLY.—Wisconsin River and two wells on the bank, pumping to tanks and direct. PUMPS.—Smith-Vaile. Wisconsin bituminous lump coal used; av. cost, $3.50 per short ton, delivered. TANKS.—Cap., 47,250 galls.; two. DISTRIBUTION.—Mains; cost extensions met by tax. Taps, 90; made by city. Services paid for by city to curb. Meters, 0. Hydrants, public, 15. CONSUMPTION.—(Galls.) max., 87,800. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $12,000. Floating debt, $1,000. Expenses: Operating, $1,100. MANAGEMENT.—Rept. by Supt., G. M. Marshall, June 6, '96. SEWERS.—None.

40. **LA CROSSE,** La Crosse Co. (25,090.) Built in '77 by city. SUPPLY.—Mississippi River (pumping direct?). PUMPS.—Cap., 16,000 galls.; 2,500,000 and 4,000,000 Blake comp. cond.; 10,000,000 Holly vert. triple exp. Av. cost of coal used, $2.58 per short ton and pine slabs at $1.60 per cord, delivered. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 29.8 miles; cost extensions met by bonds or surplus. Taps, 2,596; made by consumer, no fee. Services, galv. i.; paid for by consumer. Meters, 3; owned, controlled and repaired by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 294; private, 16. CONSUMPTION.—(Galls.) av., 3,484,400. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Two steam fire engnies are owned by city, but seldom used. FINANCIAL.—Cost, $325,582. Bonded debt, $155,000, at 5%, due from 1904 to 1915; also $70,000 of water, sewer and school bonds, not separately rept. Expenses: Operating, $15,572. Revenue, $27,860; City, none. MANAGEMENT.—Chn., S. F. Nice; Ch. Pump. Engr., F. J. Durbin. Rept. by Secy., Jacob Hahn, July 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 28, '82.

41. **LAKE GENEVA,** Walworth Co. (2,297.) Built in '90 by Lake Geneva Water & Light Co.; put in operation in Aug. Engr., W. H. Wheeler, Beloit. Contrs., Eclipse Wind Engine Co. FRANCHISE.—25 yrs. from '90; provides for purchase of works by city at end of 15 yrs. and every 5 yrs. thereafter. Rates are fixed in franchise. Co. is exempt from local taxes. City to pay for street sprinkling and $50 per hydrant. No legal difficulties. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000. Bituminous lump coal used; av. cost, $2.15 per short ton. TANK.—Cap., 100,000 galls.; cypress; on double brick tower 65 ft. high; diam. of inner cylinder, 8 ft.; outer, 29½ ft. diam. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by Co. Taps, 174; made by consumer for $1. Services, galv. i. or lead, paid for by consumer. Meters, 2; owned and repaired by consumer; controlled by Co. Use of meters optional with Co. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. MANAGEMENT.—Prest., Geo. Hinchliff, Chicago. Supt., R. C. Ayer. Rept. by Secy., E. P. Wheeler, Ashland, June 17, '96. SEWERS.—None.

42. **LAKE MILLS,** Jefferson Co. (1,053.) Built in '93 by city. Contrs., F. B. Fargo & Co. SUPPLY.—Drilled wells, by pumping. PUMP.—An 8 × 10-in. Goulds, driven by gasoline engine. Gasoline used. RESERVOIR.—Cap., 86,000 galls. DISTRIBUTION.—Mains, 2 miles; cost extensions met by city. Taps, 100; made by city for 25 cts. Services, 1 in.; paid for by owner. City can compel use of meters and any consumer may have one. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 45,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $11,000. Bonded debt, $5,000, at 5%. Expenses: Operating, $1,000. Revenue: Street sprinkling, $100; other purposes, $600. MANAGEMENT.—Rept. by Prest., Conrad Engsberg, Aug. 29, '96. SEWERS.—Has sanitary and storm sewers.

43. **LANCASTER,** Grant Co. (1,543.) Built in '96 by city; put in operation in Mar. Engr., H. G. Parrish, Morrison, Ill. SUPPLY.—Spring, pumping to stand-pipe and direct. Spring is 3 miles from town and has dy. flow of 4,000,000 galls. PUMPS.—Cap., 750,000 galls.; Deane comp. dup. Oak wood used; av. cost, $1.75 per cord. STAND-PIPE.—Cap., 105,000 galls.; ⅛ to ¼-in. steel; 16 × 70 ft., on stone foundation. FISCAL YEAR CLOSED in Apr. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxation. Taps, 104; made by city, free. Services, galv. i.; paid for by consumer. Meters, 22; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 36. PRESSURE.—Ordi-

nary, 50 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $24,000. Bonded debt, $24,000, at 5%; $4,000 due in 4 yrs., the balance to be paid yearly in $1,000 installments. Revenue: Street sprinkling, $90. MANAGEMENT.—Prest., W. H. Dicker; Secy., August Michaelis; Supt. and Ch. Pump. Engr., John Stephans. Rept. by Des. Engr., Aug. 4, '96. SEWERS.—None.

44. **LODI,** Columbia Co. (736.) Built in '95 by village; put in operation June 1. Engrs., Wheeler & Co., Beloit, Wis. Contrs., F. A. Headron & Co., Wausau, Wis. SUPPLY.—Wells, pumping to reservoir. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure (rept. by makers). RESERVOIR.—Cap., 100,000 galls.; 180 ft. above village. FISCAL YEAR CLOSED in May. DISTRIBUTION.—Mains, 2¾ miles. Taps, 45; made by village. Services, lead. Meters, 0. Hydrants, public, 17. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $12,000. Rept. by Vill. Clk., S. W. Watson, June 20, '96. SEWERS.—None.

45. **MADISON,** Dane Co. (13,426.) Built in '82 by city. SUPPLY.—Artesian wells, pumping direct. Large air chamber has been substituted for tank. PUMPS.—Cap., 4,000,000 galls.; two Reynolds-Corliss non-cond. engines driving 1,500,000 and 2,500,000 Knowles pumps. Anthracite pea coal used; av. cost, $4.12 per short ton. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 30 miles; cost extensions met by general fund set aside for water-works. Taps, 1,994; made by city for $2. Services, lead; paid for by city to curb. Meters: 1,224; owned, controlled and repaired by city. Use of meters optional with city; compulsory for almost all consumers. Hydrants, public, 150; private, 2. CONSUMPTION.—(Galls.) av., 859,467; max., 1,232,000; min., 550,000. PRESSURE.—Ordinary, 82 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $297,278. Bonded debt, $18,000 at 5%. Expenses: Operating, $14,183; int., $900. Revenue, $21,056: Consumers, unmetered, $7,182; metered, $13,374; street sprinkling, $500. City raises $10,000 by general tax levy for water-works; $5,000 for construction and $5,000 for int. MANAGEMENT.—Prest., John R. Melvin; Secy., O. S. Norsman; Treas., John H. Clark; Ch. Pump. Engr., Peter Ganer. Rept. by Supt., John B. Heim, June 6, '96. PROJECTED IMPROVEMENTS.—The placing of 300 meters on old services in addition to those on new ones. SEWERS.—Has sanitary sewers only.

46. **MANITOWOC,** Manitowoc Co. (7,710.) Built in '88 by Moffett, Hodgkins & Clarke. FRANCHISE.—20 yrs. from '87. Provides for purchase of works any time after 10 yrs. from date of franchise. Max. rates are fixed in franchise. City to pay $6,500 per yr. for 132 hydrants on original 12.3 miles of mains and $40 each for additional; Co. must furnish water free to additional hydrants on original mains, placed at expense of city. SUPPLY.—Lake Michigan, through filter galleries, pumping to stand-pipe. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Worthington, a comp. non-cond. and a simple high pressure. STAND-PIPE.—Cap., 272,000 galls.; steel; 20 × 116 ft. DISTRIBUTION.—(In '88.) Mains, 15 miles. Taps, 150. Hydrants, 132. CONSUMPTION.—(Galls.) av., 1,200,000. FINANCIAL.—(In '88.) Cost, $200,000. Bonded debt, $165,000 at 6%. Expenses, $12,400: Operating, $2,500; int., $9,900. Revenue, $14,500: Consumers, $8,000; City, $6,500. NOTE.—No rept. since '90-1 Manual.

47. **MARINETTE,** Marinette Co. (11,523.) Built in '88 by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—20 yrs.; provides for purchase of works by city in '99 and every 5 yrs. thereafter. Rates are fixed in franchise. SUPPLY.—Green Bay, pumping direct. Intake pipe, 20 in., 6,000 ft. long, ending in 30 ft. of water. PUMPS.—Cap., 7,000,000 galls.: 3,000,000 Worthington comp. cond.; 2—2,000,000 Deane. DISTRIBUTION.—Mains, 25 miles. Hydrants, public, 201. PRESSURE.—Ordinary, 50 lbs.; fire, 80-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy., J. F. Cockburn; Treas., J. P. McIntyre; Supt., M. Kirkpatrick. Rept. by Co., Aug. 20, '96. SEWERS.—Has sewers.

48. **MARSHFIELD,** Wood Co. (3,450.) Built in '92-3 by Marshfield Water, Electric Light & Power Co.; tested Jan. 18. Engr. (?), Henry C. Hodgkins, Syracuse. Fire protection plant previously owned by Upham Mfg. Co., under contract with village. FRANCHISE.—Exclusive; 30 yrs. contract with city. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 comp. STAND-PIPE.—Cap., 158,000 galls.; 15 × 120 ft. DISTRIBUTION.—Mains, 6 miles. Hydrants, 65. FINANCIAL.—(Water and light plant, for '92.) Cap. Stock, $100,000. Bonded debt, $100,000 at 6%. Expenses, $10,200: Operating, $4,200; int., $6,000. Revenue, $14,230. NOTE.—Subject to revision; information from press repts. and bond advertisement of Co.

49. **MAUSTON,** Juneau Co. (1,343.) Built in '96 by city and H. C. Strong; put in operation in May. Contrs., Fairbanks, Morse & Co. and H. C. Strong. "City owns 10,318 ft. of the mains and H. C. Strong 4,766 ft., which the city rents." SUPPLY.—Driven wells, pumping to reservoir. PUMP.—Cap., 720,000 galls.; Fairbanks, Morse & Co. dup. RESERVOIR.—Cap., 178,000 galls. DISTRIBUTION.—Mains, 2 4-5 miles. Taps, 87; made by city for $8. Services, galv. i.; paid for by consumer. Meters: 1; owned by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 24. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $16,600. Bonded debt, $10,000 at 5%. Expenses, Operating, $700. Rept. by O. M. Carte, Jan. 20, '97. SEWERS.—Has storm sewers only. Just system Mar-n

50. **MAZO MANIE,** Dane Co. (1,084.) Water and electric light plant built in '93-4 by village. Contrs., Fairbanks, Morse & Co., Chicago. Small fire protection plant built

by village in '88. SUPPLY.—Ten driven wells, pumping direct (reservoir 60 × 20 ft., elev. of 200 ft., projected for construction in '94). PUMP.—Dup. steam. DISTRIBUTION.—Mains, about 1½ miles. FINANCIAL.—Cost, both plants, $10,000. NOTE.—Repts. in '94; subject to revision.

P 5. **MENASHA,** Winnebago Co. (4,581.) Works are under discussion, with chances in favor of private ownership. Repts. from S. S. Little, Cy. Clk., and P. V. Lawson, Mayor, Dec., '96.

51. **MENOMINEE,** Dunn Co. (5,491.) Built in '84-5 by Moffett, Hodgkins & Clarke. FRANCHISE.—20 yrs. City to pay $50 each per hydrant per yr. SUPPLY.—Springs and Red Cedar River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; two Gordon & Maxwell dup. comp. cond. STAND-PIPE.—Cap., 88,000 galls.; 15 × 80 ft. DISTRIBUTION.—Mains, 10.6 miles. Taps, 190. Hydrants, 106. PRESSURE.—(In '88.) Ordinary, 90 lbs.; fire, 150 lbs. FINANCIAL.—(In '88.) Cost, $125,000. Bonded debt, $90,000 at 5%. NOTE.—No rept. since '90-1 Manual.

52. **MERRILL,** Lincoln Co. (6,809.) Built in '87 by City Water-Works; controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE—30 yrs.; provides for purchase of works by city in '97 and every 5 yrs. thereafter. Maximum rates are fixed in franchise. SUPPLY.—Filter gallery on bank of Prairie River, pumping direct. PUMPS.—Cap., 3,000,000 galls; 2—1,500,000 Deane, one comp. and one high pressure. Wood used as fuel. FILTERS.—Cap., 1,000,000 galls.; Warren (rept. by makers, Dec. 28, '96, as "about ready for operation.") FILTER GALLERY.—(In '90.) 250 ft. long, below bed of river in sand and gravel. FISCAL YEAR CLOSED Dec., '95. DISTRIBUTION.—Mains, 14 miles. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 150. PRESSURE.—Ordinary, 45 lbs.; fire, 80-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy. and Treas., B. A. Maggim; Supt., M. F. Wright. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96. SEWERS.—None.

53. **MILWAUKEE,** Milwaukee Co. (204,468.) Built in '72-3 by city. SUPPLY.—Lake Michigan, pumping direct and to reservoir, with repumping to stand-pipes for high service. INTAKE.—Brick-lined tunnel, 7½ ft. diam., 3,200 ft. long, and 2—60-in. c. i. pipes laid in trench in bottom of lake to 60 ft. of water, terminating in submerged intake cribs. PUMPS.—Cap., 46,000,000 galls.: 16,000,000, 12,000,000 and 18,000,000 Allis. Youghiogheny bituminous screenings used; av. cost, $2.04 per short ton. RESERVOIR.—Cap., 21,500,000 galls.; 150 ft. above lake. STAND-PIPES.—Cap., 223,000 galls.: 211,000 and 12,000; 15 × 160 and 4 × 130 ft., respectively; each steel, enclosed in ornamental towers, resting on concrete foundations. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 292½ miles; cost extensions met by assessments and city in equal parts. Taps, 31,489; made by city for $6 to $8. Services, lead; paid for by consumer or owner. Meters: 15,951; owned and repairs paid by consumer or property owner; controlled by city; yearly rental, $2. City can compel the use of meters for business places and any consumer may have one. Hydrants, public, 2,174; private, 12. CONSUMPTION.—(Galls.) av., 25,291,050. PRESSURE.—Ordinary, 25 to 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $4,633,435. Debt, $3,200,000: Floating, $1,600,000, at 4% to 7%; Bonded, $581,000, at 7%, due 1903; $250,000, at 5%, due 1912-'15; $769,000, at 4%, due 1908-'11. No sinking fund; 5% of bonds retired yearly by earnings of dept., amounting in '95 to $161,250. Expenses and disbursements, $466,424: Operating, $118,632; int., $88,048. Revenue, $441,932: Consumers, unmetered, $131,622; metered, $223,250; City, fire protection, $38,780; street sprinkling, $7,274; other purposes, special rates, $41,006. Balance of $80,000 paid to general city fund. No deficits. MANAGEMENT.—Bd. of Pub. Wks.: Prest., Engr. and Supt., G. H. Benzenberg; Secy., F. Schneider; Ch. Pump. Engr., Thos. McMillan. Rept. by Supt., July 11, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, May 21, '81; new intake, Oct. 25, '90, and Sept. 19, '95, illus. and inset; flooding of tunnel, Apr. 28, '92.

—? **MINOCQUA,** Vilas Co. (Not given.) Built in '94 by town. Contr., J. E. Jackson, Rhinelander. Cost, about $4,000. Press rept. in '94. July, '96, citizen rept. town owned works, with fire hydrants, and indicated that stand-pipe was used.

54. **MONROE,** Green Co. (3,768.) Built in '89-90 by Monroe Water-Works Co.; put in operation Nov. 1, '90. FRANCHISE.—20 yrs. from '90. City to pay $50 per hydrant per yr. SUPPLY.—Deep wells, pumping to tank and direct. Well, 40 × 40 ft. deep, with 120-ft. wells sunk in bottom. PUMPS.—Cap., 2,500,000 galls.; Smith-Vaile 1,500,000 and 1,000,000. Bituminous lump coal used; av. cost, $2.37 per short ton. TANK.—Cap., 105,000 galls.; 30 × 20 ft.; wood; on brick tower 70 ft. high. DISTRIBUTION.—Mains, 7 miles. Taps, 500; made by Co. for $16, of which half goes to plumber. Services, lead; paid for by consumer or property owner. Meters, 12; owned by Co. Hydrants, public, 72. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 75 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $90,000. Revenue: City, fire protection, about $5,000. MANAGEMENT.—Prest. and owner, W. H. Wheeler, Beloit; Secy., E. C. Wheeler, Beloit. Rept. by Supt. and Ch. Pump. Engr., W. J. Considine, Oct. 23, '96. SEWERS.—Has sanitary and storm sewers.

55. **MONTFORT,** Grant Co. (467.) Built in '94 by village; put in operation in Oct. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Well, pumping to tank. PUMPS.—Eclipse windmill. RESERVOIR.—Cap., 50,000 galls. TANK.—Cap., 36,000 galls.;

16 x 24 ft., on 40 ft. tower. DISTRIBUTION.—Mains, ½ mile. Taps, 6; made by village. Services, iron; paid for by consumer. Hydrants, public, 8. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $3,500. Bonded debt, $4,000, at 5%. MANAGEMENT.—Prest., P. T. Stevens. Rept. by Secy., F. W. Stevens, June 20, '96.

56. **NEENAH,** Winnebago Co. (5,083.) Built in '93 by city. Engr., Geo. W. Sturtevant, Chicago. Contr., E. T. Sykes, Minneapolis. No legal difficulties. SUPPLY.—Lake Winnebago and artesian wells, pumping to stand-pipe. PUMPS.—Cap., 2,900,000 galls.; 1,650,000 and 1,250,000 Deane comp. dup. Slack and screenings used; av., cost, $3.15 and $3.75 per short ton. RESERVOIR.—Cap., 160,000 galls.; storage. STAND-PIPE.—Cap., 265,000 galls.; steel; 20 x 115 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 7 miles; cost extensions met by general fund. Taps, 254; made by city for $6.50. Services, lead and galv. i.; paid for by consumer. Meters, 3; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 75; private, 1. CONSUMPTION.—(Galls.) av., 150,000; max., 175,000; min., 120,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 lbs. Steam fire engines used. FINANCIAL.—Cost, $75,000. Bonded debt, $65,000, at 5%, due 1918. Expenses: Operating, $2,400; int., $3,000. Revenue: Consumers, unmetered, $3,000; metered, $100; City, none. MANAGEMENT.—Secy., T. T. Moulton; Ch. Pump. Engr., Wm. G. Denhardt. Rept. by Supt., J. E. Johnson, July 30, '96. SEWERS.—Has sanitary and storm sewers.

57.—**NEILLSVILLE,** Clark Co. (1,936.) Built in '85 by city; new pumping station built in '95, old one sold to Electric & Water Supply Co. SUPPLY.—River, pumping to stand-pipe and direct. PUMP.—(In '89.) Cap., 500,000 galls.; Worthington. STAND-PIPE.—Cap., 150,000 galls.; 16 x 100 ft. DISTRIBUTION.—(In '90.) Mains, 5 miles. Taps, 60. Hydrants, 16. PRESSURE.—Ordinary (in '88), 90 lbs. FINANCIAL.—(In '90.) Revenue, $650. MANAGEMENT.—Rept. by Supt., John Cannon.

58. **NEW RICHMOND,** Saint Croix Co. (1,408.) Built in '93 by city; put in operation Jan. 1. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, pumping to tank and direct. PUMP.—Cap., 750,000 galls.; Smith-Valle, dup. Mixed soft woods used; av. cost, $2.25 per cord. RESERVOIR.—Cap., 62,500 galls.; distributing. TANK.—Cap., 47,000 galls.; wooden; 24 x 20 ft., on a trestle. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by public funds. Taps, 70; made by city. Services, galv. i.; paid for by consumer. Meters, 3; owned, controlled and repaired by city. Use of meters optional with consumer; compulsory for railroads. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 65,000; max., 150,000; min., 30,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $17,000. Bonded debt, $18,400, at 5%, due in installments commencing '98. Expenses, including electric light plant: Operating, $3,200 (?). Revenue: Consumers, $1,200. MANAGEMENT.—Prest., M. P. McNally; Supt., E. H. Maskery. Rept. by Cy. Clk. Wm. Hughes, Sept. 9, '96. SEWERS.—None.

—?, 59. **OCONTO,** Oconto Co. (5,219.)

OCONTO WATER-WORKS CO.

Built in '83. SUPPLY.—Oconto River, pumping to tank. TANK.—Cap., 32,000 galls.; 50 ft. above village. DISTRIBUTION.—Mains, 1.4 miles. Taps, 20. Hydrants, 6. FINANCIAL.—Cost, $4,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Aug. 30, '84.

OCONTO WATER CO.

Built in '91. Press repts. state receiver was appointed in '92; also that in '95 several yrs. litigation terminated in allowing liens for material furnished for construction, making liens prior to $100,000 mortgage bonds issued in '90. Decree held stockholders (two in number) liable for indebtedness up to $100,000, the amount of stock, and ordered cancellation of $100,000 bonds, issued in '90 and held by stockholders. FRANCHISE.—30 yrs. from '91. City to pay (in '90) $65 per hydrant per yr. SUPPLY.—Artesian wells, pumping direct. PUMPS.—Cap., 3,500,000 galls.: 2—1,500,000 Deane dup.; 500,000 Barr. DISTRIBUTION.—Mains (in '90), 7 miles; cost extensions met by Co. Taps made by consumer for $2 fee. Services, galv. i.; paid for by consumer. Meters, 3; owned, controlled and repaired by consumer. Use of meters optional with consumer. Hydrants, public, 108; private, 2. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost (in '90), $100,000. Cap. Stock: Authorized, $100,000. Bonded debt, see above. MANAGEMENT.—Prest., Geo. Beyer; Treas., S. D. Andrews, Norway, Me.; Supt., F. A. Smith. Rept. by Secy., S. W. Ford. SEWERS.—Has sanitary sewers.

60. **ONALASKA,** La Crosse Co. (1,587.) Built in '94 by city; put in operation Aug. 21. Engr., C. F. Loweth, St. Paul. Contr., Tobin Gleason, Minneapolis. SUPPLY.—Large open and an artesian well, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon. Wood used; av. cost, 95 cts. per cord. Use 1 cord per day. STAND-PIPE.—Cap., 150,000 galls.; steel; 16 x 110 ft. FISCAL YEAR CLOSED Aug. 21. DISTRIBUTION.—Mains, 3 miles; cost extensions met by taxation. Taps, 115; made by city, free. Services, ¾-in. galv. i.; paid for by consumers. Meters, 0. City can compel the use of meters and any consumer may have one. Hydrants, public, 21. CONSUMPTION.—(Galls.) av., 87,200. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FI-

NANCIAL.—Cost, $15,000. Bonded debt, $15,000, at 6%, due Feb. 1, 1914. Expenses: Operating, $580; int., $900. Revenue, $772. MANAGEMENT.—Secy., Geo. Howard. Rept. by Supt. and Pump. Engr., Sept. 18, '96; also by Engr., in '96. SEWERS.—None.

61. **OSHKOSH,** Winnebago Co. (22,836.) Built in '84 by Oshkosh Water-Works Co. FRANCHISE.—30 yrs. from '94; provides for purchase of works by city prior to or in '98. Rates limited by franchise. Co. is not exempt from local taxes. City to pay $70 per hydrant per yr. for 200 hydrants on 20 miles of mains, $400 per mile for 10 extra hydrants. No legal difficulties. SUPPLY.—Lake Winnebago, pumping direct. PUMP.—Cap., 9,500,000 galls.: 1,500,000 Worthington comp. non-cond.; 2—4,000,000 Holly-Gaskill hor. high duty. FILTERS.—Cap., 2,400,000 galls.; Warren. RESERVOIR.—Cap., 500,000 galls.; used to store filtered water; covered. DISTRIBUTION.—Mains, 40 miles. Taps, 1,479; made by Co. for $4.50. Services, lead or galv. i.; paid for by consumer. Meters, 38; owned by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 356; private, 7. CONSUMPTION.—(Galls.) av., 2,100,000; max., 2,900,000; min., 1,900,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 to 110 lbs. FINANCIAL.—Cost, $540,000. MANAGEMENT.—Rept. by Treas., W. G. Maxcy, June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 23, '86; Warren filters, Jan. 4, '94, illus.

62. **PHILLIPS,** Price Co. (Est., 816.) Built in '98 by city; put in operation Sept. 1, '98. Operated by J. R. Davis Lumber Co. SUPPLY.—Elk River, pumping direct. FISCAL YEAR CLOSED Sept. 30. DISTRIBUTION.—Mains, 1 mile; cost extensions met by taxation. Taps, 30. Services, iron; paid for by owner. Meters, 0. Hydrants, public, 7; private, 12. CONSUMPTION.—No records kept. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. Deficits all met by taxation. MANAGEMENT.—Rept. by F. W. Sackett, Aug. 22, '96. SEWERS.—Has sanitary and storm sewers.

63. **PLATTEVILLE,** Grant Co. (2,740.) Built in '96 by city; put in operation Sept. 15. Engr., Chester B. Davis. Contrs., Fairbanks, Morse & Co., both of Chicago. SUPPLY.—Artesian well, pumping from receiving reservoir to tank. PUMP.—Cap., 1,000,000 galls.; Fairbanks, Morse & Co. comp. Local press rept., Jan., '97, stated air-lift plant had just been installed, with 12½ × 14-in. Ingersoll-Sergeant compressor. Av. cost of coal used, $3.05 per short ton; wood, $2.50 per cord. RESERVOIR.—Cap., 60,000 galls. TANK.—Cap., 78,000 galls.; pine; 20 × 26 ft., on 70-ft. brick tower. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by general tax. Taps, 90. Services, lead; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 23. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $16,500. Bonded debt, $14,000, at 5%; due $1,000 yearly from 1903. Expenses: Int., $700. Revenue, about $800. MANAGEMENT.—Mayor and Supt., E. B. Smith. Rept. by Supt., Dec., '96. PROJECTED IMPROVEMENTS.—City expects to lay a mile of mains each year, which will require 4 or 5 yrs. to complete the system. SEWERS.—Has storm sewers only.

64. **PORTAGE,** Columbia Co. (5,143.) Built in '87 by Portage Water Co. Press repts. state W. G. Maxcy, Oshkosh, was appointed receiver in May, '95, Co. having defaulted on interest on first mortgage bonds since payment due Jan. 1, '94; and also on the $13,000 issued on second mortgage given Jan. 1, '92. Oct., '95, U. S. Court ordered foreclosure and sale within a year, but it was stated in Dec., '96, that sale had been "again" postponed. Jan., '97, Portage City Water Co. was incorp. with authorized cap. stock of $75,000; Prest., Jas. C. Fox, Portland. Also rept. in Jan. and Feb., '97, that plant had been bought at foreclosure sale for $200,000 by Theo. Woodbury, Chn. Bondholders Com., Portland, Me. FRANCHISE.—20 yrs.; provides (press rept.) for purchase by city in 10 yrs. SUPPLY.—Wisconsin River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington, a comp. non-cond. and simple high pressure. STAND-PIPE.—Cap., 293,000 galls.; steel; 25 × 80 ft., top 150 ft. above town. DISTRIBUTION.—(In '88.) Mains, 9 miles. Taps, 181. Meters, 8. Hydrants, 75. CONSUMPTION.—(Galls.) av., 140,000. FINANCIAL.—Cost, $125,000. Bonded debt, $100,000 (see above). Expenses, Operating, $2,500; int., $6,000. Revenue, $9,000. NOTE.—No official rept. since '90-1 Manual.

65. **PRAIRIE DU CHIEN,** Crawford Co. (3,131.) Built in '75-6 by Prairie du Chien Artesian Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates not subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artesian well, by natural pressure direct through mains. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Taps, 25. Services, lead, paid for by property owner. Meters, 0. Hydrants, public, 10. CONSUMPTION.—Unknown. FINANCIAL.—Cap. Stock: Paid-up, $10,000. No debt. Sinking Fund, $500. Expenses, $325: Operating, $300; taxes, $25. Revenue, $575: Consumers, $250; City, fire protection, $300; street sprinkling, $25. MANAGEMENT.—Prest., M. Menger. Rept. by Supt. and Secy., F. H. Poehler, June 5, '96. SEWERS.—None. REFERENCE.—Eng. News, Feb. 18, '82.

66. **RACINE,** Racine Co. (21,014.) Built in '86-7 by Racine Water Co. First supply developed in '70 by Artesian Well Co. FRANCHISE.—25 yrs. from '88; provides for purchase of works by city in 1908 and at intervals of 5 yrs. thereafter, price to be determined by three commissioners. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay for fire hydrants. No legal

difficulties. SUPPLY.—Lake Michigan, pumping to tank and direct. PUMPS.—Cap., 8,500,000 galls.: 4,000,000 Allis vert. triple exp.; 2—2,250,000 Blake. Bituminous slack used; av. cost, $1.75 per short ton. TANK.—Cap., 330,480 galls.; 25 × 90 ft., on concrete foundation, 45 ft. high above ground surface and 110 ft. above lake datum. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 40 miles. Taps, 3,500; made by Co. at $1.50 for ½-in. tap. Services, lead; paid for by owner of property. Meters, 529; owned, controlled and repaired by Co.; yearly rental, $2. Use of meters compulsory for manufacturers and hotels. Co. can compel use of meters and any consumer may have one. Hydrants, public, 396; private, 13. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—(In '90.) Cost (in '88), $750,000. Bonded debt, $400,000, at 6%; due 1906. MANAGEMENT.—Prest., Henry E. Cobb; Treas., Chas. E. Eddy, both of 35 Congress St., Boston; Ch. Pump. Engr., Henry Kester. Rept. by Supt. and Secy., W. H. Laing, July 10, and Treas. in Oct. SEWERS.—Has combined sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 3, '81, May 12, '88.

67. **REEDSBURG,** Sauk Co. (1,737.) Built in '95 by city; put in operation Feb. 1. Engrs., Fairbanks, Morse & Co., Chicago, Ill. Contr., P. McDonnell, Duluth, Minn. SUPPLY.—Three 6-in. flowing wells, pumping from collecting reservoir to tank and direct. PUMPS.—Cap., 750,000 galls.; Worthington simple high pressure. Wood used; av. cost, $2 per cord. RESERVOIRS.—Cap., 40,000 galls. TANK.—Cap., 63,000 galls.; wood; 21 × 24 ft., on brick tower. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by direct taxation. Taps, 165; made by city for $15. Services, galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 31. CONSUMPTION.—(Galls.) av., 80,000; max., 100,000; min., 10,000. PRESSURE.—Ordinary, 30 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $22,000, at 5%; due $2,000 yearly. Expenses: Operating, $2,000; int., $1,100. Revenue, $3,620: Consumers, $2,205; City, fire protection, $1,240; street sprinkling, $75; other purposes, $100. MANAGEMENT.—Secy., C. A. Clark; Ch. Pump. Engr., E. M. Robinson. Rept. by Supt., C. C. Stearns, Sept. 8, '96. SEWERS.—Has storm sewer on main street.

68. **RHINELANDER,** Onedia Co. (2,658.) Built in '87 by town; improved in '90-1. SUPPLY.—Wisconsin River, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. STAND-PIPE.—Steel. DISTRIBUTION.—Mains, 7 miles. Taps, 330. Hydrants, public, 106. FINANCIAL.—Cost, $90,000. Expenses, including int., $7,000. Revenue, $5,200. MANAGEMENT.—Supt., A. D. Sutton. Rept. by Clk., Wm. W. Carr, Sept. 26, '96.

69. **RICE LAKE,** Barron Co. (2,130.) Built in '92 by Rice Lake Water-Works Co.; put in operation in Dec. Contrs., Fairbanks, Morse & Co., St. Paul. FRANCHISE.—30 yrs. from '92. City to pay $20 per yr. per hydrant. SUPPLY.—Artesian well, 230 ft. deep, also intake from lake, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Smith-Vaile and Buffalo comp., 750,000 each. DISTRIBUTION.—Mains, 3 miles. Taps, 57; made by Co. Hydrants, public, 20; private, 22. CONSUMPTION.—(Galls.) av., 150,000; max., 225,000; min., 80,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock, Authorized, $30,000; paid-up, $25,500. No debt. MANAGEMENT.—Prest., C. A. Chamberlain; Secy., W. H. Willard, Eau Claire; Rept. by Supt., O. B. Playtor, June 25, '96. SEWERS.—None.

70. **RICHLAND CENTRE,** Richland Co. (1,819.) Built in '89 by city. SUPPLY.—Artesian well, pumping to reservoir. PUMPS.—Cap., 81,600 galls.; 57,600 Smith-Vaile dup., and 24,000 Fairbanks-Morse comp. Bituminous coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 120,000 galls. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by taxation. Taps, 200; made by consumer, no fee. Services, lead and iron; paid for by property owner. Meters: 1; owned by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 32; private, 4. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $15,000. Expenses, Operating, $1,000. Revenue: Consumers, $1,200; street sprinkling, $40. MANAGEMENT.—Rept. by E. G. Ostrander. SEWERS.—None.

71. **RIPON,** Fond du Lac Co. (3,358.) Owned by Ripon Light & Water Co.; built in '90 by Ripon Water Co., which in '93 bought out Ripon Lighting Co., and changed name to above. All local capitalists. FRANCHISE.—20 yrs. from '90; provides for optional purchase of works by city after 10 yrs. and at close of each 5 yrs. thereafter; price determined by arbitration. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $6,340. LEGAL DIFFICULTIES.—Co. is now suing city for rebate of '95 taxes. SUPPLY.—Wells or springs, pumping to stand-pipe or direct. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Gordon. Bituminous coal used; av. cost, $2.23 per short ton. STAND-PIPE.—Cap., 130,000 galls.; steel; 15 × 105 ft., on rock foundation. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 7 miles; cost extensions met by bonds. Taps, 496; made by Co. Services, galv. i.; paid for by consumer. Meters: 16; owned, controlled and repaired by Co. Use of meters optional with Co. Hydrants, public, 82. CONSUMPTION.—(Galls.) av., 280,000; min., 76,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $125,000. Cap. Stock, paid-up, $40,000; paid 4% div'd in '95. Debt, $70,000: Floating, $10,000, at 7%; Bonded, $60,000, at 6%; due from 1916. Sinking Fund, none. Revenue: Consumers, $4,408; City, fire protection,

$4,186. MANAGEMENT.—Prest., H. C. Every; Vice-Prest., L. D. Moses; Treas., D. V. N. Harwood; Ch. Pump. Engr., M. Nippert. Rept. by Supt. and Secy., T. D. Stone, June 6, '96. SEWERS.—Has sanitary and partial system of storm sewers.

72. **RIVER FALLS,** Pierce Co. (1,073.) Built in '94 by city. Engr., C. F. Loweth, St. Paul. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, 500 ft. deep, pumping to reservoir. PUMP.—Cap., 900,000 galls.; Fairbanks, Morse & Co. Wood used; av. cost, $1.50 per cord. RESERVOIR.—Cap., 185,000 galls.; 30 × 60 ft.; covered. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general taxation. Taps, 95; made by city for $18, including service to property line. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 40; private, 1. CONSUMPTION.—(Galls.) av., 80,000; max., 110,000; min., 50,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $23,000 at 5%; due in 18 yrs. Expenses, Operating, $902. Revenue, $779: Street sprinkling, $25; public buildings, $100; other purposes, $654. Deficits met by general taxation. MANAGEMENT.—Mayor, G. W. Chinnon; Ch. Pump. Engr., W. W. Thayer. Rept. by Cy. Clk., Allen P. Weed, June 20, '96; also by Engr. in '96. SEWERS.—None.

73. **SHARON,** Walworth Co. (878.) Built in '96 by village; was to be tested in Dec. Engrs., Alvord & Shields, Chicago. Contrs., W. H. Wheeler & Co. SUPPLY.—Well, 330 ft. deep, pumping to collecting reservoir and repumping to tank. PUMPS.—Deep well and triplex. Gasoline used as fuel. TANK.—Cap., 42,300 galls.; 12 × 50 ft.; steel, on 60-ft. brick tower. DISTRIBUTION.—Mains, 3¼ miles. Hydrants, public, 32. FINANCIAL.—Bonded debt, $14,000 at 5%. MANAGEMENT.—Secy., Wm. Hamlin. Repts. by Vill. Prest., D. G. Morris, latest being Dec. 10, '96. SEWERS.—None.

74. **SHEBOYGAN,** Sheboygan Co. (16,359.) Built in '87 by City Water Co.; now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—Provides for purchase of works by city in '97 and at intervals of 5 yrs. thereafter; price to be fixed by arbitration. Rates are fixed in franchise. SUPPLY.—Lake Michigan, pumping to stand-pipe. PUMPS.—Cap., 10,000,000 galls.; 2—1,500,000 Worthington comp. cond.; 1—3 000,000 Gordon; 1—4,000,000 Holly-Gaskill hor. high duty. STAND-PIPE.—Cap., 329,000 galls.; iron; 20 × 140 ft. DISTRIBUTION.—Mains, 35 miles. Hydrants, public, 352. PRESSURE.—Ordinary, 50-60 lbs.; fire, 80-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., W. S. Kuhn, Pittsburg, Pa.; Supt., W. D. Cockburn. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Aug. 20, '96.

75. **SHELL LAKE,** Washburn Co. (1,535.) Built in '90 by village; put in operation in Nov. SUPPLY.—Shell Lake, pumping to tank and direct. PUMPS.—Cap., 1,440,000 galls.; three. Owned by Shell Lake Lumber Co., which receives $1,250 per yr. for operating same. TANK.—Cap., 22,440 galls.; on wood trestle, 30 ft. square, 50 ft. high. DISTRIBUTION.—Main: Cost extensions met by public funds or direct taxation. Taps, made by consumer, no fee. Services, galv. i.; paid for by property owner. Hydrants, public, 21; private, 25. CONSUMPTION.—(Galls.) av., 432,000; min., 214,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $15,000. Expenses: Operating, $1,500. MANAGEMENT.—Chn. Bd. of Supervisors, Andrew Ek; Treas., B. C. Hanson. Rept. by C. E. Gregory, Master Mechanic, Aug. 17, '96. SEWERS.—Has storm sewers only.

76. **SHULLSBURG,** Lafayette Co. (1,393.) Built in '95 by city. Engrs., Crellin & Lovell, Des Moines, Ia. SUPPLY.—Well, pumping direct. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure. Bituminous coal used; av. cost, $2 per short ton. FISCAL YEAR CLOSED Apr. 20. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by issue of city bonds. Taps, 25; made by city for $3. Services, lead and iron; paid for by consumer. Meters, 0. City can compel the use of meters and any consumer may have one. Hydrants, public, 17. PRESSURE.—Ordinary, 120 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $9,000. Debt, $9,500: Floating, $1,500, at 7%; Bonded, $8,000, at 5%, due $500 yearly after 1896. Expenses, Operating, $1,200. Revenue, Consumers, $200. MANAGEMENT.—Mayor and Supt., L. N. Townsend; Pump. Engr., J. Metcalf. Rept. by Cy. Clk., A. A. Townsend, June 20, '96. PROJECTED IMPROVEMENTS.—Reservoir. SEWERS.—Has storm sewers.

77. **SOUTH MILWAUKEE,** Milwaukee Co. (Not given.) Built in '94 by village; put in operation in May. Engrs., Dousman & Sheldon, Milwaukee. Engr. for stand-pipe, Oscar Saane, Milwaukee. SUPPLY.—Lake Michigan, pumping to tank. A 10-in. c. i. intake pipe extends from 30,000-gall. receiving well to a submerged c. i. crib, ¼ mile from shore. PUMP.—Cap., 1,500,000 galls.; 2—750,000 Worthington comp. cond. Indiana and Illinois bituminous lump coal used; av. cost, $2.15 per short ton. TANK.—Cap., 80,000 galls.; steel, on brick tower; total height, 110 ft. DISTRIBUTION.—Mains, 4 miles; cost extensions met by property tax. PRESSURE.—Ordinary, 45 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost, $45,000. MANAGEMENT.—Ch. Pump. Engr., John Ray. Rept. by J. H. Dousman, Dec. 22, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Cast iron intake crib; Eng. News, July 26, '94, illus.

81. **SOUTH SUPERIOR,** Douglas Co. (Not given.) Supply from Superior.

78. **SPARTA,** Monroe Co. (996.) Built in '95 by city; put in operation Oct. 1. Engrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Two surface wells, pumping to tank and direct. Wells are 12 × 20 and 30 × 23 ft. PUMP.—Cap., 2,000,000 galls.; 2—

1,000,000 Laidlaw-Dunn-Gordon. Wood used; av. cost, $2.50-$2.25 per cord. TANK.—Cap., 67,000 galls.; 24 × 20 ft., on 20-ft. tower, on hill 130 ft. high. FISCAL YEAR CLOSED Mar. 20. DISTRIBUTION.—Mains: Cost extensions met by public funds. Taps, 125; made by consumer for $2. Services, ¾-in. iron; paid for by consumer. Meters: 2; owned, controlled and repaired by consumer. City can compel the use of meters and any consumer may have one. Hydrants, public, 37; private, 1. CONSUMPTION.—(Galls.) av., 152,910. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $29,-719. Bonded debt, $22,600 at 5%, due 1,000 yearly for 12 yrs. and $1,500 for each following, until paid. Expenses, Operating, $697. Revenue: Consumers, unmetered, $913; City, fire protection, $1,140. MANAGEMENT.—Supt., J. K. Jewett; Ch. Pump. Engr., Benj. Phillips. Rept. by Cy. Clk. and Treas., Howard Teasdale, June 20, '96. SEWERS.—Has ½ mile sanitary sewers.

79. **STEVENS POINT,** Portage Co. (7,896.) Built in '87-8 by Stevens Point Water Co. FRANCHISE.—20 yrs. from '87; provides for optional purchase of works by city every 5 yrs. Rates are not subject to regulation by city. Co. is not exempt from local taxes, but receives compensation from city for public service. SUPPLY.—Wisconsin River, pumping to stand-pipe, and direct for fire protection. PUMPS.—Cap., 4,000,000 galls.; 2—2,000,000 Holly hor. dup. Wood used. FILTERS.—Cap., 500,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 329,000 galls.; iron; 20 × 140 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by Co. Taps, made by Co. for $3.50. Services, iron or lead; paid for by consumer. Meters: 180; owned and repaired by consumer; controlled by Co.; yearly rental, $2 to $5. Co. can compel use of meters and any consumer may have one. Hydrants, public, 144; private, 2. CONSUMPTION.—(Galls.) av., 250,000; max., 1,000,000; min., 100,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 to 125 lbs. FINANCIAL.—Cost, withheld. Bonded debt, $100,000, at 5%; due 1916. No deficits. MANAGEMENT.—Prest., C. E. Gray, White Water; Secy., M. G. Jeffris, Janesville; Pump. Engrs., N. M. & C. H. Towle. Rept. by Supt. W. O. Lamoreux, July, '96. PROJECTED IMPROVEMENTS.—New source of supply. SEWERS.—Has partial system of storm sewers only. REFERENCES.—Stand-pipe accident, Eng. News, May 3, '94, illus.

80. **STOUGHTON,** Dane Co. (2,470.) Built in '85 by village. SUPPLY.—Two artesian wells, pumping to tank. PUMPS.—Cap., 1,500,000 galls.; two Deane, one comp., one high pressure. TANK.—Cap., 80,000 galls., on brick tower, total height, 116 ft. FISCAL YEAR CLOSED Apr. 7, '96. DISTRIBUTION.—Mains, 9½ miles. Taps, 367. Meters, 3. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 150,685. FINANCIAL.—Cost, $30,000. Bonded debt, $20,000. Sinking Fund, $2,000. MANAGEMENT.—City Clerk, Wm. C. Hegelmeyer; Supt., Louis Midgaard. Rept. by City Clerk.

81. **SUPERIOR,** Douglas Co. (11,983.) Now owned by Superior Water, Light & Power Co.; built in '87-8 by Superior Water-Works Co. Supplies West and South Superior. FRANCHISE.—30 yrs. from '87; provides for purchase of works by city in 1908, and at intervals of 5 yrs. thereafter. Max. rates fixed in franchise. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. LEGAL DIFFICULTIES.—Press repts. state that in Aug., '95, city voted to institute proceedings to annul franchise, on ground of violation of franchise by furnishing impure water and deficient pressure; and that Attorney-General refused to allow proceedings to be instituted. Later repts. stated Co. agreed to reduction of rates and city agreed to stop proceedings to annul franchise. SUPPLY.—Lake Superior, pumping direct. PUMPS.—Cap., 5,000,-000 galls.: 3,000,000 Allis. vert. comp. cond.; 2—1,000,000 Deane comp. dup. Mixed bituminous and anthracite screenings used; av. cost, $1.50 per short ton. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 43 miles; cost extensions met by bonds. Taps, 990; made by Co. Services, lead; paid for by property owner. Meters, 114; owned by consumer; controlled and repaired by Co. Use of meters optional with Co.; compulsory for factories, office buildings and hotels. No meters allowed in private residences. Hydrants, public, 642; private, 10. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 65 lbs.; fire, 125 lbs. Two steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $1,000,000; all paid-up; no div'd in '95. Bonded debt, $1,200,-000, at 6%. (N. B.—Capital stock and bonds cover gas and electric light plant.) MANAGEMENT.—Prest., W. R. Merriam, St. Paul; Secy., W. H. Winslow, West Superior. Rept. by Genl. Mgr., A. A. Cross, West Superior, June 9, '96. PROJECTED IMPROVEMENTS.—Filtration galleries in natural sand peninsula, now under construction. SEWERS.—Has combined sanitary and storm sewers.

82. **THORP,** Clark Co. (723.) Built in '94 by village; put in operation in Oct. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Surface well, pumping to tank and direct. PUMP.—Worthington dup. fire. Wood used. TANK.—Cap., 63,000 galls.; on steel trestle 80 ft. high. FISCAL YEAR CLOSED Oct., '96. DISTRIBUTION.—Mains, ½ mile; cost extensions met by taxation. Taps, 20. Services, iron; paid for by consumer. Hydrants, public, 10; private, 1. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $7.000. MANAGEMENT.—Rept. by Supt., J. D. Rasmusson, Nov. 16, '96. SEWERS.—None.

83. **TOMAH,** Monroe Co. (2,199.) Built in '95 by city; put in operation Jan. 1. SUPPLY.—Wells, pumping to tank and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Smith-Vaile dup. Oak wood used; av. cost, $2 per cord. STAND-PIPE.—Cap.,

35,000 galls.; 11 × 48 ft. high, on 70-ft. brick tower. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by public funds. Taps, 140; made by consumer for $6.25. Services, ¾-in. iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $30,000. Expenses: Operating, $1,100. Revenue: Street sprinkling, $50. Plant is self-sustaining, paying about $500 annually into the city sinking fund. MANAGEMENT.—Rept. by Supt., Geo. J. Howard, June 20, '96. SEWERS.—None.

84. **TOMAHAWK,** Lincoln Co. (1,816.) Built in '91 by city; put in operation Dec. 15. Engr., E. T. Sykes, Minneapolis. SUPPLY.—Spring and Wisconsin River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; Smith-Valle. Wood used; av. cost, $250 a year. STAND-PIPE.—Cap., 100,000 galls. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 5 miles. Taps made by city for $1. Services paid for by consumer. Meters owned, controlled and repaired by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $29,000. Bonded debt, $9,500, at 7%. Expenses: Int., $2,100. Deficits met by general taxation. MANAGEMENT.—Treas., A. J. Fitsgerald. Supt., R. Foraker.

— ? **VIROQUA,** Vernon Co. (Est., 1,270.) Jan., '97, citizen rept. that stand-pipe had been put in by city. Press rept., Oct., '96, stated pipe would be of steel, 16 × 110 ft., on masonry foundation 6 ft. deep.

85. **WASHBURN,** Bayfield Co. (3,089.) Built in '89 by Washburn Water-Works Co. Press repts. state city bought works in Oct., '94, for $136,000; that new city administration declared the bond issue illegal and refused to pay first installment of purchase price, on which Co. again took possession. FRANCHISE.—25 yrs. from '89; provides for purchase of works by city at end of 15 yrs. Co. is exempt from local taxes for 10 yrs. City to pay $4,900 per yr. for public service. SUPPLY.—Lake Superior, pumping to reservoir and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. Hocking screenings used; av. cost, $1.85 per short ton. RESERVOIR.—Cap., 1,200,000 galls.; distributing 200 ft. above principal business street. DISTRIBUTION.—Mains, 6 miles. Taps, 320; made by Co. Services, galv. i.; paid for by consumer. Meters, 2; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for R. R. Hydrants, public, 64; private, 4. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—(In '90.) Cap. Stock: Paid-up, $100,000. Bonded debt, $75,000, at 6%. MANAGEMENT.—Prest., W. G. Maxcy, Oshkosh; Secy., F. H. Hartshorn; Supt., J. L. Smith. Rept. by Treas., D. M. Maxcy, June 11, '96. SEWERS.—Has sanitary sewers.

86. **WATERTOWN,** Jefferson Co. (862.) Bought by city Sept., '96, for $105,424, which was actual cost of plant; built in '96 by Watertown Water-Works Co.; put in operation June 20. Engr., Geo. C. Morgan, Chicago. Contr., W. H. Wheeler & Co., Beloit. SUPPLY.—Artesian well, flowing 864,000 galls. per day, pumping to reservoir, stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; Stillwell-Bierce & Smith-Valle. Indiana block coal used; av. cost, $3 per short ton. RESERVOIRS.—Cap., 350,000 galls. STAND-PIPE.—Cap., 150,000 galls.; 18 × 80 ft., on stone and brick foundation. DISTRIBUTION.—Mains, 14½ miles. Services, lead; paid for by consumer. Meters: Consumer may purchase or rent a meter; yearly rental, $2. Hydrants, public, 150. PRESSURE.—Ordinary, 86 lbs.; fire, 150 lbs. FINANCIAL.—Cost $105,000. Cap. Stock: Authorized, $100,000; paid-up, $20,000. Bonded debt, $90,000, at 6%; due in installments. Revenue: City, fire protection, $6,000. MANAGEMENT.—Prest., M. J. Woodward; Treas., Wm. D. Spraesser; Supt., Julius Fox. Rept. by Secy., Wm. F. Voss, June 26, '96, before city bought works. SEWERS.—Has sanitary and partial system of storm sewers.

87. **WAUKESHA,** Waukesha Co. (6,321.) Built in '88 by Waukesha Water-Works Co. FRANCHISE.—20 yrs. from '87; provides for optional purchase of works by city after 10 years. Rates are fixed by agreement with city. Co. is not exempt from local taxes. City to pay $37.50 each per yr. for first 80 hydrants and $30 for each additional one at the rate of one to each 500 ft. of mains. SUPPLY.—Three artesian wells, pumping to tank and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Knowles. Also 1,000,000-gall. Pohle air-lift, with 160-HP. Allis engine (makers rept. 12 × 16-in. Rand air compressor). Illinois bituminous coal used. RESERVOIRS.—Cap., 335,000 galls.; 85,000 and 250,000. TANK.—Cap., 330,000 galls.; 40 × 35 ft., iron, on elevation of 160 ft. above datum of city. DISTRIBUTION.—Mains, 12½ miles; cost extensions met by Co. Taps, 500; made by Co. at actual cost. Services, galv. i.; paid for by consumer. Meters, 5; owned and repaired by consumer; controlled by Co. Use of meters compulsory for large consumers. Co. cannot compel but may prohibit the use of meters. Hydrants, public, 126. CONSUMPTION.—(Galls.) av., 500,000; max., 750,000; min., 350,000. PRESSURE.—Ordinary, 65 lbs.; fire, 90 lbs. One steam fire engine is owned by city but not used as yet. FINANCIAL.—Cost, $150,000. No debt. Works have just been bought under receiver's sale and are being reorganized. Figures cannot be given as yet. MANAGEMENT.—Owner, Jas. Parsons, Philadelphia, Pa; Supt., Geo. F. Deakin. Rept. by Trustee, A. J. Frame, June 10, '96. SEWERS.—Has sanitary and partial system of storm sewers.

P 6. **WAUPACA**, Waupaca Co. (2,127.) City granted franchise to A. M. Hansen and F. S. Baldwin in '96. Feb. 1, '97, Hansen & Baldwin rept. that contracts had not been let, but works would include dam, flume and water wheel; 2—750,000 comp. pumps; 350,000-gall. reservoir; 36,000 ft. 4 to 12-in. mains; 70 hydrants. Engrs., Sturtevant & Todd, Chicago. Est. cost, $50,000. Press rept. states franchise is for 35 yrs. and that city has right to buy works within one yr.

88. **WAUPUN**, Fond du Lac Co. (2,757.) Built in '95 by city; put in operation Oct. 22. Engr., Fairbanks, Morse & Co., Chicago. Contrs., W. H. Wheeler & Co., Beloit. SUPPLY.—Two artesian wells, pumping to tank and direct. PUMPS.—Cap., 1,750,000 galls.; 2—875,000 Deane dup. Bituminous coal used; av. cost, $3 per short ton. RESERVOIR.—Cap., 45,000 galls.; storage. TANK.—Cap., 63,18± galls.; wood, 21 x 24 ft., on 70-ft. stone tower. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by public funds. Taps, 174; made by city for $7.50 to curb. Services, ¾-in. galv. i.; paid for by consumer. Meters, 8; owned by city and consumer; controlled and repaired by city. Use of meters compulsory for factories. City can compel use of meters and any consumer may have one. Hydrants, public, 44. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 55 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $32,000. Bonded debt, $30,000, at 4%. Expenses: Operating, $700. Deficits met by general taxation. MANAGEMENT.—Mayor, O. A. Morse; Ch. Pump. Engr., P. McGarry. Rept. by Supt., J. W. Oliver, June 27, '96. SEWERS.—None.

89. **WAUSAU**, Marathon Co. (9,253.) Built in '85 by city. SUPPLY.—Surface well, 40 x 37 ft., and filtering gallery, pumping direct. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 Holly-Gaskill hor. high duty. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 22 miles; cost extensions met by city fund. Taps, 1,162; made by city for $4. Services, lead; paid for by property owner. Meters, 0. Use of meters optional with city. Hydrants, public, 148. CONSUMPTION.—(Galls.) av., 1,250,000; max., 1,500,000; min., 1,000,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $288,103. Bonded debt, $90,000, at 5%, due 1905. Expenses: Operating, $7,382; int., $4,500. Revenue: Consumers, $12,047; City, fire protection, $8,000. MANAGEMENT.—Rept. by A. N. Gearhart, July 11, '96. SEWERS.—Has sanitary and storm sewers.

90. **WEST DE PERE**, Brown Co. (Est., 2,100.) Built in '87-8 by West De Pere Artesian Water Supply Co. FRANCHISE.—25 yrs. SUPPLY.—Two artesian wells, by gravity. DISTRIBUTION.—Mains, 3.5 miles. Taps, 100. PRESSURE.—Ordinary (in '88), 40 lbs. FINANCIAL.—Cap. Stock, $20,000. No debt. MANAGEMENT.—Prest., Paul Scheuring; Supt., R. L. Jackson. Rept. by Secy., E. A. Lange, Sept. 24, '96.

81. **WEST SUPERIOR**, Douglas Co. (Not given.) See Superior.

91. **WHITEHALL**, Trempealeau Co. (304.) Built by city; put in operation Jan. 1, '96. Engr., H. A. Crosby, La Crosse. Contr., Foley & Connelly, Green Bay. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—Cap., 189,000 galls. RESERVOIR.—Cap., 150,000 galls. DISTRIBUTION.—Taps, 20. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 1,575. PRESSURE.—Ordinary, 160 lbs. FINANCIAL.—Cost, $5,000. Bonded debt, $3,000. MANAGEMENT.—Prest., Geo. Quackenbush; Ch. Pump. Engr., W. H. Smith. Rept. by Vill. Clk., C. J. McNaughton, July 27, '96. SEWERS.—None.

92. **WHITE WATER**, Walworth Co. (4,359.) Built in '89 by White Water Water-Works Co. FRANCHISE.—25 yrs. from '88; provides for purchase of works by city at end of 10 yrs., and every 5 yrs. thereafter. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $4,033 per yr. for public service. No legal difficulties. SUPPLY.—Artesian well, pumping to reservoir, stand-pipe and direct. PUMP.—Cap., 1,500,000 galls.; Deane comp. dup. Illinois bituminous coal used; av. cost, $2.65 per short ton. RESERVOIR.—Cap., 850,000 galls.; near pumping plant. TANK.—Cap., 160,000 galls.; 30 x 35 ft.; steel, on octagonal stone tower, 85 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 9 miles; cost extensions met by issuing bonds. Taps, 350; made by Co., free. Services, galv. i.; paid for by consumer. Meters, 10 or 12; owned, controlled and repaired by Co.; yearly rental, $3. Co. can compel use of meters and any consumer may have one. Hydrants, public, 96; private, 1. CONSUMPTION.—(Galls.) av., 150,000; max., 250,000; min., 60,000. PRESSURE.—Ordinary, 75 lbs.; fire, 125 lbs. FINANCIAL.—Cost, about $100,000. Cap. Stock: Authorized, $80,000; all paid-up. Balance withheld. MANAGEMENT.—Secy., T. W. Gray; Treas. and Supt., J. R. Gray. Rept. by Prest., C. E. Gray, July 27, '96. SEWERS.—Has partial system of storm sewers only.

GROUP VI.—NORTHWESTERN STATES.

Water-Works Completed, in Process of Construction or Projected, in Iowa, Minnesota, Kansas, Nebraska, South Dakota, North Dakota, Wyoming and Montana.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

IOWA.*

1. **ACKLEY,** Hardin Co. (1,286.) Rented by city; built in '95 by Ackley Water-Works Co.; put in operation May 1. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city at expiration of franchise. SUPPLY.—Artesian well, 2,030 ft. deep, pumping to tank. PUMP.—Cap., 84,000 galls.; Downie, double acting, deep well, operated by electric motor. TANK.—Cap., 55,000 galls.; 12½ × 60 ft., on iron tower, total height 85 ft. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 3,050 ft. Taps, 25. Services, iron; paid for by consumer. Meters: 2; owned by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 15,000; max., 20,000; min., 10,000. FINANCIAL.—Cost, $7,000. MANAGEMENT.—Prest., C. F. Pfander; Secy., S. T. Eggert. Rept. by Supt., Theo. T. Roosevelt, Aug. 25, '96. SEWERS.—For hotel and few private houses.

2. **ADEL,** Dallas Co. (995.) Built in '95 by city. SUPPLY.—Pumping to stand-pipe.

F 1. **AKRON,** Plymouth Co. (494.) Built in '95 by town. Engrs., Smedley Mfg. Co., Dubuque. Direct pressure, Smedley pump. Av. cost of coal, $2.45 per short ton. Mains, 1 mile; cost extensions met by taxation. Hydrants, public, 24.

F 2. **ALGONA,** Kossuth Co. (2,068.) Built in '90 for fire protection. Well, pumping to stand-pipe. Mains, 1,600 ft. Hydrants, 5. Cost, $9,000. No rept. since '90-1 Manual.

3. **ALTA,** Buena Vista Co. (768.) Built by city; put in operation Jan. 1, '96. Des. Engr., C. F. Loweth, St. Paul; Const. Engrs. and Contrs., Jackson & Moss, Des Moines. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 86,000 galls.; American Well-Works Co., driven by 7-HP. gasoline engine. Av. cost of coal used, $2 per short ton. TANK.—Cap., 47,000 galls.; 20 × 20 ft., on steel trestle 84 ft. high. DISTRIBUTION.—Mains, 1 mile; cost extensions met by public funds. Taps, 30; made by consumer for $10. Services, ¾-in. galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $6,000. Bonded debt, $5,000 at 6%. MANAGEMENT.—Prest., M. Adams; Ch. Pump. Engr., Wm. Fowler. Rept. by C. E. Cameron, June 11, '96, and Des. Engr., in '96. SEWERS.—None.

4. **ALTON,** Sioux Co. (708.) Built by town; put in operation Jan. 1, '95. Engr., A. A. Richardson, Lincoln, Neb. Contr., J. H. Winchel, Le Mars. SUPPLY.—Well, 12 ft. diam., pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure. STAND-PIPE.—Cap., 55,000 galls.; steel, 12 × 65 ft. DISTRIBUTION.—Cost extensions met by taxation. Taps, 55; made by consumer for $6. Services, galv. i.; paid for by property owner. Use of meters optional with consumer. Hydrants, public, 14. FINANCIAL.—Cost, $10,200. Bonded debt, $9,000: $5,800 payable yearly after 10

*By a legislative act of '88, cities of the first class in Iowa may regulate the prices charged for water and gas.

yrs.; $3,200, payable anytime. Expenses: Operating, $600; int., $540. Revenue, City, $500. MANAGEMENT.—Kept. by Supt., Jno. Meyer, Aug. 24, '96. SEWERS.—None.

5. **ANAMOSA,** Jones Co. (2,078.) Built in '73-4 by Anamosa Water-Works Co. FRANCHISE.—25 yrs. from '90. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $85 per yr. for two drinking tanks. SUPPLY.—Pumping to reservoir and direct from well, 20 ft. diam., 32 ft. deep, having in bottom three driven wells, two 200 ft. and one 302 ft. deep; also connection with Wapsipinicon River. PUMPS.—(In '89.) Cap., 650,000 (?) galls.; 250,000 Gordon & Maxwell steam and 400,000 water power (makers also rept. 750,000 Worthington comp. non-cond., probably added since '89). Iowa bituminous lump coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 90,000 galls. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by revenues. Taps, 135. Services, galv. i.; paid for by consumer. Meters: 23; owned, controlled and repaired by consumer. Use of meters optional with consumer; compulsory for lawns, laundries, etc. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $32,000. Cap. Stock: Authorized, $50,000; paid-up, $6,500. Bonded debt, $9,000, at 6%, due 1900-'09. Expenses: Operating, $1,600; taxes, $93. Revenue, $3,765: City, fire protection, $1,400; street sprinkling, $165; public buildings, $1,200; other purposes, $1,000. MANAGEMENT.—Prest., C. H. Lull; Secy., W. K. Pearson; Treas., T. W. Shopley. Rept. by Supt., J. C. Griffith, June 15, '96. SEWERS.—None. REFERENCE.—Eng. News, Nov. 19, '81.

—? **ANITA,** Cass Co. (695.) Rept. as having works.

6. **ARMSTRONG,** Emmet Co. (Est., 681.) Built in '96 by city; put in operation May 1. Engr., Chas. F. Loweth, Minneapolis. Contrs., Crellin & Lovell, Des Moines. SUPPLY.—8-in. well, pumping to tank. TANK.—Cap., 78,000 galls.; wooden; on steel tower. DISTRIBUTION.—Mains, 2,600 ft.; cost extensions met by issuance of water certificates. Taps made by city. Hydrants, public, 6. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $3,000 at 6%; due 10 yrs. MANAGEMENT.—Prest., A. A. Reynolds; Secy., R. Gabriel; Ch. Pump. Engr., James Num. Rept. by Secy., June 11, '96. SEWERS.—None.

7. **ATLANTIC,** Cass Co. (4,351.) Leased by city since Mar. 1, '90; built in '82-3 by Atlantic Water Co. FRANCHISE.—25 yrs. from '82. City pays as rental, all int. on bonds, 6% on stock and all expenses. No legal difficulties. SUPPLY.—Driven wells, pumping direct. PUMPS.—Cap., 4,000,000 galls.; Holly, 2,000,000-gall. and 2—1,000,000 quadruplex. Bituminous lump coal used; av. cost, $2.50 per short ton. FISCAL YEAR CLOSED Mar. 15. DISTRIBUTION.—Mains, 9 miles; cost extensions met by revenue. Taps, 930; made by city at $10 in 66-ft. street, $11.50 in 80-ft. and $13 in 100-ft. Services, w. i.; paid for by city to curb. Meters, 0. Hydrants, public, 104. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $22,000; all paid-up; paid 6% div'd in '95. Bonded debt, $50,000, at 6%, due now. Expenses: Operating, $5,894; int., $4,320; taxes, $6. Revenue, $10,826: Consumers, unmetered, $7,189; City, fire protection, $3,637, raised by a 5-mill tax levy. MANAGEMENT.—Prest., J. A. McWard; Secy., J. S. Harlan; Ch. Pump. Engr., J. W. Love. Rept. by Supt., A. M. Nipper, June 4, '96. SEWERS.—None. REFERENCE.—Eng. News, Apr. 5, '84.

8. **AUDUBON,** Audubon Co. (1,310.) Built in '83 by town. SUPPLY.—Surface wells and creek for fire purposes, pumping to tank. PUMP.—Cap., 720,000 galls.; Barr dup. Unscreened bituminous nut coal used; av. cost, $1.56 per short ton. TANK.—Cap., 100,000 galls.; 30 × 20 ft., on wood tower, 24 ft. high. FISCAL YEAR CLOSED with '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by tax levy. Taps, 70; made by consumer, no fee. Services, w. i.; paid for by consumer. Meters, 0. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary, 70 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $7,000, at 5%. Expenses: Operating, $1,200. Revenue, Consumers, unmetered, $700. Deficits are met entirely by taxation. MANAGEMENT.—Mayor, R. L. Harris; Secy., S. B. Crevelling. Rept. by Supt., E. J. Freeman, June 4, '96. PROJECTED IMPROVEMENTS.—A new 140,000-gall. standpipe. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Oct. 25, '84.

—? **AURELIA,** Cherokee Co. (663.) Rept. as having works.

9. **AVOCA,** Pottawattamie Co. (Est., 1,598.) Built in '91 by town. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMP.—Cap., 750,000 galls.; Smedley hor. dup. STAND-PIPE.—Cap., 59,227 galls.; 12 × 70 ft. DISTRIBUTION.—Mains, 2.3 miles. Taps, 90. Services, lead. Hydrants, 26. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 68 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $13,689. Bonded debt, $15,000, at 6%. NOTE.—No rept. since '90-1 Manual.

10. **BANCROFT,** Kossuth Co. (657.) Built in '95 by town; put in operation in May. Engrs. and Contrs., Jackson & Moss, Des Moines. SUPPLY.—8-in. well, 260 ft. deep, pumping to tank. PUMP.—Operated by 5-HP. gasoline engine. TANK.—Cap., 37,000 galls.; on steel trestle 70 ft. high. DISTRIBUTION.—Mains, 1 mile. Hydrants, public, 8. FINANCIAL.—Cost, $5,300. Rept. by Jackson & Moss, Feb. 11, '97. SEWERS.—None.

—? **BATTLE CREEK,** Ida Co. (387.) Rept. as having works.

11. **BELLEVUE,** Jackson Co. (1,394.) Built in '94 by city; put in operation Oct. 10. Engr., M. Tschirgi, Dubuque. Contrs., Dubuque Construction Co. SUPPLY.—Well, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; Worthington comp. non-cond. Bituminous coal used; av. cost, $2.65 per short ton. RESERVOIR.—Cap., 500,000 galls. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 3 miles; cost extensions met by water fund. Taps, 182; made by city for $3. Services, galv. i.; paid for by consumer or owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 19; private, 2. PRESSURE.—Ordinary, 98 lbs.; fire, 80 to 98 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $10,000, at 5%, due 1904. Sinking Fund, $785, invested in bank at 5%. Expenses: Operating, $620. MANAGEMENT.—Prest., L. Bittner; Secy., W. G. Stuart; Supt., Chas. Cauklin; Ch. Pump. Engr., P. Weber. Rept. by Prest., Sept. 5, '96. SEWERS.—None.

12. **BELMOND,** Wright Co. (803.) Built in '96 by town. Engr., Jas. Todd, Batavia. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia. SUPPLY.—Wells, pumping to tank. FINANCIAL.—Cost, about $10,000. MANAGEMENT.—Recorder and Supt., E. A. Pierce. Rept. by citizen, Aug. 8, '96.

13. **BLOOMFIELD,** Davis Co. (1,913.) Built in '92-3 by city. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Deep well, pumping to covered reservoir, thence repumped to tank and direct. PUMPS.—Deep well; also 500,000-gall. Worthington comp. non-cond. Av. cost of coal used, $1.75 per short ton. TANK.—Cap., 50,000 galls.; on 50-ft. wood trestle, located on hill. DISTRIBUTION.—Mains, 3 miles; cost extensions met by taxation. Hydrants, public, 25. PRESSURE.—Ordinary, 31 lbs.; fire, 80 lbs. MANAGEMENT.—Rept. by D. F. Cavanagh, Supt., Jan. 7, '97.

14. **BODE,** Humboldt Co. (Est., 353.) Built in '94 by city. Engrs. and Contrs., Jackson & Moss, Des Moines. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 94,500 galls.; steam and wind mill. Av. cost of coal used, $4 per short ton. TANK.—Cap., 31,500 galls.; storage; 18 × 18 ft., wood, on wood trestle 70 ft. high. FISCAL YEAR CLOSED Mar. 20. DISTRIBUTION.—Mains, 1,900 ft.; cost extensions met by water fund and taxes. Taps, 38; made by city. Services, iron and lead; paid for by property owner. Meters, 2; owned, controlled and repaired by city. Use of meters compulsory for creamery and mill. City can compel use of meters and any consumer may have one. Hydrants, public, 6; private, 1. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—Ordinary, 60 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $3,800. Debt, $3,000: Floating, $1,000, at 6%; Bonded, $2,000, at 5%; due in 20 yrs. Sinking Fund, $620, invested at 6%. Expenses are paid by rentals. MANAGEMENT.—Mayor, Gus. T. Peterson; Supt. and Ch. Pump. Engr., K. J. Lomen. Rept. by Mayor. SEWERS.—Has storm sewers only.

15. **BOONE,** Boone Co. (6,520.) Built in '84 by city. SUPPLY.—Artesian wells, pumping to tank and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane dup. Bituminous lump coal used; av. cost, $2.30 per short ton. RESERVOIR.—Cap., 500,000 galls.; at pumps. TANK.—Cap., 22,000 galls.; iron, on brick tower. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 2 miles; cost extensions met by bonds. Taps, 175; made by consumer. Services, lead and galv. i.; paid for by consumer. Meters, 190; owned and controlled by city; yearly rental, $3.60. Use of meters compulsory for all consumers. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 40 lbs.; fire, 175 lbs. FINANCIAL.—Cost, $60,000. Floating debt, $48,000 at 5%. Expenses, $6,891: Operating, $4,421; int., $2,470. Revenue: Consumers, metered, $3,300. Deficits are met by general taxation. MANAGEMENT.—Rept. by Cy. Clk., Jesse L. Hull, July 8, '96. PROJECTED IMPROVEMENTS.—An additional artesian well is now under construction, has reached depth of 2,000 ft. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 10, '85.

16. **BRITT,** Hancock Co. (818.) Built in '94 by city. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Well, pumping to tank. PUMPS.—A 500,000-gall. triplex, driven by 26-HP. Otto gasoline engine for domestic, and Smith-Vaile for fire service. TANK.—Cap., 55,000 galls.; on 40-ft. steel tower. FINANCIAL.—Cost, about $10,000. MANAGEMENT.—Recorder, Geo. Williams.

17. **BROOKLYN,** Poweshiek Co. (1,202.) Built in '94 by city. SUPPLY—Two 3-in. deep wells, pumping to tank. PUMPS.—Cap., 2,500 (?) galls. each; operated by gasoline engine. TANK.—Cap., 47,000 galls.; wood; 20 × 20 ft., on brick tower. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by taxes. Taps, 140; made by city, free. Services, iron or lead; paid for by consumer. Meters, about 25; owned and repairs paid by consumers; controlled by city. Use of meters compulsory for stables and large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 1,500. FINANCIAL.—Cost, $9,700. Bonded debt, $8,000, at 5%, due in 1904; $1,500, at 5%, due in '98. Expenses: Operating, $350. Revenue: Consumers, $800. Rept. by O. H. Leonard, Oct. 24, '96.

18. **BURLINGTON,** Des Moines Co. (22,565.) Built in '77-8 by Burlington Water Co. FRANCHISE.—25 yrs. from '77. Rates are regulated by city contract and must not exceed those in six cities which are named. Co. is partly exempt from local taxes. LEGAL DIFFICULTIES.—In regard to filtration. SUPPLY.—Mississippi River, pumping direct. PUMPS.—Cap., 17,500,000 galls.: 6,000,000 and 3,500,000 Holly-Gaskill hor. high duty, latter for high service; 8,000,000, make not given. FILTERS.—Cap., 3,500,-

000 galls.; Jewell, gravity. A 20 × 120-ft. filter bed was formerly used. DISTRIBUTION.—Taps, 2,200; made by Co., free. Services, iron and lead; paid for by Co. to curb. Meters, 70; owned, controlled and repaired by Co.; yearly rental, $4.80. Hydrants, public, 221. PRESSURE.—Ordinary, 100 lbs.; fire, 120 to 140 lbs. FINANCIAL.—(In '90.) First cost, $185,000. Cap. Stock: Authorized, $300,000; paid-up, $30,000; paid 12% div'd in '90. Bonded debt, $174,000, at 6%. Expenses: Operating, $18,000; int., $10,440. Revenue: Consumers, $18,000; city collects 5-mill tax levy of $19,000 and pays int. on Co.'s bonds. MANAGEMENT.—Rept. by Supt., Chas. Hood, Sept. 19, '96. REFERENCES.—Eng. News, Aug. 27, '81; filtration, May 28, '96, illus.

19. **CALMAR,** Winneshiek Co. (813.) Built in '96 by town; put in operation May 15. Contr., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 6,000 galls. TANK.—Cap., 78,000 galls.; cypress; on 90-ft. tower. FISCAL YEAR CLOSED Mar. 10. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by public funds. Taps, 46; made by consumer for $2. Services, lead and iron; paid for by consumer. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 14; private, 4. CONSUMPTION.—(Galls.) av., 6,000; max., 8,000; min., 4,000. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $9,500. Bonded debt, $4,000, at 6%. Expenses, $1,902: Operating, $750; int., $180; taxes, $972. Revenue: Consumers, $210. MANAGEMENT.—Prest. and Supt., E. M. Hefler; Secy., S. N. Yager; Ch. Pump. Engr., O. A. Lenold. Rept. by Supt., July 27, '96. SEWERS.—Has storm sewers only.

20. **CARROLL,** Carroll Co. (2,448.) Built in '83-4 by town. SUPPLY.—Surface well, pumping to tank. PUMP.—Cap., 750,000 galls. TANK.—Cap., 70,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 21. Hydrants, 11. FINANCIAL.—Cost, $10,500. Bonded debt, $10,000, at 6%. Expenses $900: Operating, $300; int., $600. Revenue: Consumers, $225. NOTE.—No rept. since '90-1 Manual.

21. **CASCADE,** Dubuque Co. (955.) Built in '95 by city; put in operation May 1. Engr., M. Tschirgi; Contrs., Smedley Mfg. Co., both of Dubuque. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 334,000 galls. Av. cost of wood used, $2.50 per cord. STAND-PIPE.—Cap., 70,000 galls.; steel; on 70-ft. steel trestle; Contrs., Crellin & Lovell, Des Moines. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by public funds. Taps, 75; made by city for $2.50. Services, galv. i.; paid for by consumer. Hydrants, public, 37. CONSUMPTION.—(Galls.) av., 50,000. FINANCIAL.—Cost, $11,000. Bonded debt, $10,000, at 5%; due May 1, 1915. Sinking Fund, $172. MANAGEMENT.—Rept. by J. H. Weber, June 11, '96.

22. **CEDAR FALLS,** Blackhawk Co. (3,459.) Built in '87-8 by town. SUPPLY.—Springs, pumping to tank. PUMP—Cap., 2,000,000 galls.; 1,000,000 Worthington simple high-pressure; 1,000,000 Smedley comp. dup., added since '91. TANK.—Cap., 100,000 galls.; wood; 30 × 20 ft., on 75-ft. iron trestle. DISTRIBUTION.—(In '89.) Mains, 3.7 miles. Taps, 92. Meters, 2. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary (in '88), 80 lbs. FINANCIAL.—(In '89.) Cost, $33,100. Bonded debt, $30,000, at 6%. Expenses, $2,800: Operating, $1,000; int., $1,800. Revenue: Consumers, $900. NOTE.—No rept. since '90-1 Manual.

23. **CEDAR RAPIDS,** Linn Co. (18,020.) Built in '75-6 by Cedar Rapids Water Co. FRANCHISE.—25 yrs. from '75; provides for purchase of works by city in 1900. Rates are subject to regulation by city; must not exceed average rates for Burlington, Davenport, Des Moines and Dubuque. Co. was exempt from local taxes for first 7 yrs. City to pay $50 each for first 200 hydrants. LEGAL DIFFICULTIES.—From city cutting price on all hydrants to $50 each. SUPPLY.—Three artesian wells, 1,425 ft. deep, and water from Cedar River, filtered, pumping direct. PUMPS.—Cap., 6,000,000 galls.; 2,000,000 Worthington; 1,000,000 and 3,000,000 McGowan. Bituminous nut coal and slack used; av. cost, $1.50 per short ton. FILTERS.—Cap., 4,000,000 galls.; Jewell, gravity. RESERVOIR.—Cap., 300,000 galls.; under filter house. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 31 miles; cost extensions met by selling stock and bonds. Taps, 1,900; made by Co. for 50 cts. each. Services, lead; paid for by consumer from center of street. Meters, 30; owned, controlled and repaired by Co. Use of meters compulsory for laundries, R. Rs. and manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 200; private, 12. CONSUMPTION.—(Galls.) av., 2,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $300,000. Cap. Stock, paid-up, $181,000. Bonded debt, $105,000, at 5%; due 1925; $15,000 worth of bonds unsold. Expenses, taxes, $4,000. Revenue: City, (fire protection, parks and fountains), $10,000. MANAGEMENT.—Prest., C. B. Souther; Secy. and Treas., J. C. Brocksmit. Rept. by Supt., Chas. J. Fox, June 4, '96. PROJECTED IMPROVEMENTS.—About 18 miles of mains and a new 5,000,000-gall. pumping engine. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 29, '82; Jewell filters, May 28, '96.

24. **CENTREVILLE,** Appanoose Co. (3,668.) Built in '96 by city; put in operation Mar. 1. Engr., H. L. Bowen; Contrs., C. P. Miller & Co.; all of Chicago. FRANCHISE.—20-yrs. No legal difficulties. SUPPLY.—Artesian well, pumping to stand-pipe and direct. PUMP.—Cap., 1,700,000 galls.; two Deane dup. Bituminous coal used; av. cost, $1.25 per short ton. RESERVOIR.—Cap., 260,000 galls.; storage (at well?). STAND-PIPE.—Cap., 85,000 galls.; steel, 12 × 100 ft. DISTRIBUTION.—Mains, 7½ miles; cost

extensions met by public funds. Taps, 54; made by city, free. Services, galv. i.; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 40 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $65,000. Bonded debt, $2,200: $1,200 at 6%, due July 5, 1897; $1,000 at 5%, due in 20 yrs. Expenses, Operating, $1,500. Revenue: City, fire protection, $3,900; street sprinkling, $110. Deficits met by 5-mill tax levy. MANAGEMENT.—Prest., W. G. Clark; Ch. Pump. Engr., W. W. Clark. Rept. by Cy. Clk., J. B. Gribbin, July 27, '96. SEWERS.—Has storm sewers only.

P 1. **CHARITON**, Lucas Co. (3,122.) Chariton Water-Works Co. secured franchise in '96. Proposed supply, artesian well, pumping to stand-pipe. Secy., G. W. Ensley; Prest., S. H. Mallory. Rept. by W. E. Lewis, Oct. 22, '96.

25. **CHARLES CITY**, Floyd Co. (2,902.) Built in '87 by city. SUPPLY.—Spring, impounded, pumping direct. Emergency supply can be taken from river. PUMPS.—Cap., 1,250,000 (?) galls.; 1,000,000 and 250,000 Knowles water-power. Makers rept. 8 × 10-in. Goulds pump, driven by water wheel (probably installed since last rept.). DISTRIBUTION.—Mains, 2.5 miles. Taps, 70. Hydrants, 25. PRESSURE.—(In '88.) Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $21,000. Bonded debt, $20,000, at 5%. Expenses, $2,450: Operating, $1,450; int., $1,000. Revenue: Consumers, $854. Revenue goes into general fund of city, from which all expenses are paid. NOTE.—No rept. since '90-1 Manual.

26. **CHARTER OAK**, Crawford Co. (567.) Built in '92 by city. Engr., C. Wilson. Contrs., U. S. Supply Co., Omaha, Neb. SUPPLY.—Pumping to tank. PUMP.—Cap., 180,000 galls.; Smith-Valle. Bituminous run of mine coal used; av. cost, $2.60 per short ton. TANK.—Cap., 63,000 galls.; 25 × 18 ft., on 45-ft. trestle. DISTRIBUTION.—Taps, 75; made by consumer. Services paid for by town. Meters, 4; owned and controlled by city. Use of meters compulsory for livery and feed stables. City can compel use of meters and any consumer may have one. Hydrants, public, 14; private, 1. CONSUMPTION.—(Galls.) av., 11,000. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $3,500, at 6%; due in 1912. No sinking fund. MANAGEMENT.—Prest., P. D. McMahon; Secy., A. F. Kadoch; Ch. Pump. Engr., J. W. Mills. Rept. by Secy., Dec. 17, '96. SEWERS.—None.

27. **CHEROKEE**, Cherokee Co. (3,441.) Built in '89 by city. SUPPLY.—Artesian wells, pumping to stand-pipe and direct. PUMP.—Cap., 1,000,000 galls.; Smedley. STAND-PIPE.—Cap., 152,000 galls.; iron, 18 × 80 ft. DISTRIBUTION.—Mains, 2.5 miles. Taps, 150. Meters, 2. Hydrants, 18. CONSUMPTION.—(Galls.) av., 65,000. PRESSURE.—(In '89.) Ordinary, 50 to 80 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $26,000. Bonded debt, $20,000, at 5%. Expenses, $2,200: Operating, $1,200; int., $1,000. Revenue: Consumers, $1,200. NOTE.—No rept. since '90-1 Manual.

28. **CLARENCE**, Cedar Co. (629.) Built in '91 by village; put in operation July 10. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 33,000 galls.; deep well. TANK.—Cap., 50,000 galls.; soft pine, 16 × 24 ft., on wood tower 50 ft. high. DISTRIBUTION.—Mains, 5,050 ft. Taps, 80. Meters, 12. Hydrants, public, 6. FINANCIAL.—Cost, $7,500. Revenue, $350. Public school buildings are heated and pumping done by same plant, consequently cannot give other figures. MANAGEMENT.—Supt., Frank B. Rigs; Engr., W. B. Bigham. Rept. by Contrs., Dec., '96.

29. **CLARINDA**, Page Co. (3,262.) Built in '86 by town. SUPPLY.—Driven wells, pumping direct. PUMP.—Cap., 2,250,000 galls.; 1,000,000 comp. non-cond. and 1,250,000 simple high pressure Worthington. Bituminous lump coal used; av. cost, $2.10 per short ton. TANK.—Cap., 60,000 galls.; storage, at pump-house. DISTRIBUTION.—Taps, made by city for $2. Services, ¾-in.; paid for by consumer. Meters, owned by consumer; controlled by city. PRESSURE.—Ordinary, 65 lbs.; fire, 125 lbs. FINANCIAL.—Bonded debt, $40,000, at 6%. Expenses: Operating, $2,000. Revenue, $2,000. SEWERS.—Has sanitary sewers only.

30. **CLARKSVILLE**, Butler Co. (735.) Built in '95 by town; put in operation Dec. 1. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Two driven wells, pumping to tank. PUMP.—Cap., 88,400 galls.; deep-well pump, operated by gasoline engine. TANK.—Cap., 63,000 galls.; wood on 90-ft.-steel tower. DISTRIBUTION.—Mains, 1 mile. Hydrants, public, 13. PRESSURE.—Ordinary and fire, 55 lbs. FINANCIAL.—Cost, $7,500. Rept. by Ed. Madigan, Recorder, June 12, '96. SEWERS.—None.

31. **CLEAR LAKE**, Cerro Gordo Co. (1,130.) Built in '94 by city. Contrs., Smedley Mfg. Co., Dubuque. SUPPLY.—Clear Lake, pumping to 85-ft. stand-pipe or tank. MANAGEMENT.—Council. Rept. by W. E. Woodstock, July 2, '96.

32. **CLINTON**, Clinton Co. (19,418, including annexed territory.) Built in '74-5 by Clinton Water-Works Co. Lyons Water-Works Co. built works in '76 to supply Lyons. In '91, American Water-Works & Guarantee Co., Pittsburg, secured control of Lyons plant and operated it in connection with Clinton works, with joint supply. Since '91, Lyons and Clinton have been consolidated and works are all one. FRANCHISE.—25 yrs. from '87; provides for purchase of works by city at intervals of 10 yrs., price to be determined by arbitration. Rates are subject to regulation by city (under State law). Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Franchise was not ratified by popular vote; legislature passed act legalising it. SUPPLY.—Wells and Mississippi River, pumping

direct. PUMPS.—Cap., 10,000,000 galls.: 5,000,000 Holly-Gaskill hor. high duty; 3,000,000 and 2,000,000 Gordon. Bituminous coal used; av. cost, $1.25 per short ton. FILTERS.—Cap., 1,000,000 galls.; National (New York). RESERVOIR.—(In '89.) Cap., 500,000 galls.; receiving. TANK.—25 ft. high on 85-ft. brick tower. DISTRIBUTION.—Mains, not given. Taps, 2,200; made by Co. for $1. Services, lead and iron; paid for by consumer. Meters, 450; owned by Co. and consumer; controlled and repairs paid by Co.; yearly rental, $4. Co. can compel use of meters and any consumer may have one. Hydrants, public, 255. CONSUMPTION.—(Galls.) av., 2,250,000; max., 3,000,000; min., 2,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cap. Stock: Paid-up, $700,000. No floating debt. Revenue: City, fire protection, $14,500. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa. Rept. by Supt., S. M. Highlands, June 5, '96. SEWERS.—Has sanitary and storm sewers.

33. **COLFAX,** Jasper Co. (957.) Built in '87 by town. SUPPLY.—Wells, pumping to reservoir. PUMP.—Cap., 864,000 galls.; Cameron. RESERVOIR.—Cap., about 70,000 galls.; 140 ft. above pump. DISTRIBUTION.—Mains, 8,200 ft. Taps, 103. Meters, 5. Hydrants, 9. PRESSURE.—(In '88), 60 lbs. FINANCIAL.—Cost, $7,500. Bonded debt, $6,000, at 6%; due in 1902. Sinking Fund, $1,200. Expenses, $660: Operating, $300; int., $360. Revenue: Consumers, $800. NOTE.—No rept. since '90-1 Manual.

34. **COLUMBUS JUNCTION,** Louisa Co. (953.) Built in '96 by town; put in operation June, '96. Engrs., Crellin & Lovell. Contrs., Jackson & Moss, both of Des Moines. SUPPLY.—Four 6-in. wells, with Cook well strainers in sand-bed. PUMPS.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon. Bituminous lump coal used; av. cost, $3 per short ton. TANK.—Cap., 63,000 galls.; cypress, on 60-ft. steel tower. DISTRIBUTION.—Mains, 1.5 miles; cost extensions met by town warrants. Taps, 40; made by town. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 13. PRESSURE.—Ordinary, 90 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $11,000. MANAGEMENT.—Ch. Pump. Engr., Geo. Bracket. Rept. by Contrs. SEWERS.—None.

35. **COON RAPIDS,** Carroll Co. (873.) Built in '98 by city. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Driven well, pumping to tank. PUMP.—From Contrs. Mystic bituminous coal used; av. cost, $3 per short ton. TANK.—Cap., 50,000 galls. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by taxation. Taps, 40; made by licensed plumber. Services paid for by consumer. Meters: 30; owned by consumer; controlled by city. Use of meters compulsory for all consumers. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 9,450. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $5,000. Bonded debt, $3,000, at 7%. Expenses: Operating, $600; int., $210. Deficits are met by taxation. MANAGEMENT.—Secy., W. H. Rickerson. Rept. by Mayor, M. M. Cooney, Aug. 29, '96. SEWERS.—None.

36. **CORNING,** Adams Co. (1,682.) Built in '88 by city. SUPPLY.—Wells, pumping to tank. PUMP.—Cap., 70,000 galls. TANK.—Cap., 64,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 100. Hydrants, 29. CONSUMPTION.—(Galls.) av., 12,800. PRESSURE.—(In '88), 80 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $15,000, at 6%. Expenses: Operating, $600. Revenue: Consumers, $750. NOTE.—No rept. since '90-1 Manual.

P 2. **CORRECTIONVILLE,** Woodbury Co. (869.) Dec. 14, '96, town voted for water and electric light plants. Rept. by Mayor, L. P. Adams.

—? **CORWITH,** Hancock Co. (334.) Built in '96 by town. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. Cost, about $4,000.

37. **COUNCIL BLUFFS,** Pottawattamie Co. (21,474.) Built in '82-3 by Council Bluffs City Water-Works Co. FRANCHISE.—25 yrs. from '81. Rates are fixed in franchise. Co. is exempt from local taxes. City to pay $100 each for 200 hydrants and $75 for each additional one. No legal difficulties. SUPPLY.—Missouri River, pumping to settling basins with centrifugal pumps and thence repumping to storage reservoir. PUMPS.—Cap., 8,000,000 galls.; two Andrews' centrifugal pumps and 2—4,000,000 Knowles. Bituminous slack coal used; av. cost, $1.85 per short ton. RESERVOIRS.—Cap., 13,000,000 galls.; storage; also three connected settling basins with combined cap. of 122,000,000 galls. DISTRIBUTION.—Mains, 40 miles. Taps, 2,532; made by Co. at $2.75 for ⅛-in., $3.25 for ¼-in., $4 for ⅜-in. and $6 for 1-in. Services, lead; paid for by consumer. Meters: 327; owned and repairs paid by consumer or Co.; controlled by Co. Use of meters compulsory for livery barns, saloons and motors. Co. can compel use of meters and any consumer may have one. Hydrants, public, 282. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Robt. Sewell; Treas., Geo. P. Sheldon; Supt., Edward W. Hart; Ch. Pump. Engr., Robt. Young. Rept. by Supt., Sept. 19, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Dec. 15, '83.

38. **CRESCO,** Howard Co. (2,018.) Built in '91 by city. SUPPLY.—Well, 190 ft. deep, pumping to stand-pipe. STAND-PIPE.—Cap., 92,000 galls.; steel, 12½ × 100 ft. FISCAL YEAR CLOSED Mar. 1, '96. DISTRIBUTION.—Meters: 8; owned and controlled by c y. City can compel use of meters and any consumer may have one. Hydrants, pub c, 11; private, 9. PRESSURE.—Ordinary, 43 lbs.; fire, 125 lbs. FINANCIAL.—Bon ed debt, $14,500, at 6%; due in 5 to 20 yrs. from '91. MANAGEMENT.—Rept. by C). Clk., C. P. Lent, Jan. 12, '97. SEWERS.—Has storm sewers only.

39. **CRESTON,** Union Co. (7,200.) Built in '90-1 by Creston Water-Works Co.; put in operation in Nov. FRANCHISE.—25 yrs. from '91; provides for purchase of works by city at intervals of 10 yrs. Rates are fixed in franchise. City to pay $7,800 per yr. for fire protection and sewer flushing. LEGAL DIFFICULTIES.—Press rept. in '96 stated that State Supreme Court had decided city could not pay full amount of hydrant rental at present, as it exceeds 5 mills on the tax levy, which is the limit for water-works purposes. SUPPLY.—West Branch of Platte River, pumping from impounding reservoir to stand-pipe. PUMPS.—Cap., 2,500,000 galls.: 1,500,000 Smith-Vaile; 1,000,000 Barr comp. dup. Bituminous coal used; av. cost, $1.50 per short ton. FILTERS.—Cap., 500,000 galls.; Jewell. RESERVOIRS.—Cap., 385,500,000 galls.; impounding, 385,000,000 galls.; settling, 500,000 galls. STAND-PIPE.—Cap., 132,000 galls.; steel; 15 × 100 ft. DISTRIBUTION.—Mains, 13 miles. Services, lead and galv. i.; paid for by consumer. Meters, 100; owned and repairs paid by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 140. CONSUMPTION.—(Galls.) av., 800,000; max., 500,000; min., 200,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $225,000. MANAGEMENT.—Prest., J. E. Markel, Omaha; Secy., Jno. Gibson; Treas., J. B. Harsh. Rept. by Supt., Harry S. Clarke, June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Jewell filters, Eng. News, May 28, '96.

40. **DAVENPORT,** Scott Co. (26,872.) Built in '74 by Davenport Water Co. FRANCHISE.—Exclusive for 25 yrs. from '89. Provides for purchase of works by city at its expiration; if city does not purchase works franchise is thereby renewed for another 25 yrs., without further agreement. Rates are fixed in franchise. Co. is exempt from local taxes, as offset for supplying city buildings free. City to pay $40 per hydrant per year, and 10 cts. per 1,000 galls. for sewer flushing, street sprinkling and watering troughs, four troughs being supplied free. SUPPLY.—Mississippi River, pumping direct and to reservoir. PUMPS.—Low Service, Cap., 10,000,000 galls.: 5,000,000 Worthington hor. comp. high duty; 5,000,000 Clapp & Jones. High Service, Cap., 7,000,000 galls.: 5,000,000 Clapp & Jones; 2,000,000 Gordon. Bituminous slack used; av. cost, $1.25 per short ton. FILTERS.—Cap., 6,000,000 (makers rept. 7,500,000) galls.; American (New York). RESERVOIR.—Cap., 5,000,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 48 miles. Taps, 3,450; made by Co. at $2 for ¾-in. or less and $2.50 for 1-in. Services, optional; paid for by consumer. Meters, 700; owned, controlled and repairs paid by Co. Hydrants, public, 471; private, 25. CONSUMPTION.—(Galls.) av., 3,000,000; max., 5,500,000; min., 2,225,000. PRESSURE.—High Service: Ordinary, 40 lbs.; fire, 40 to 80 lbs. Low Service: Ordinary, 80 lbs.; fire, 80 to 125 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., F. H. Griggs; Secy. and Treas., Jas. P. Donahue; Supt., T. N. Hooper; Ch. Pump. Engr., C. C. Schmidt. Rept. by Supt., July 9, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Dec. 9, '82.

41. **DAYTON,** Webster Co. (669.) Built in '95 by city; put in operation Sept. Engr., Fred. Hoyt, Fort Dodge. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Well, pumping to tank. TANK.—Cap., 63,000 galls.; on 80-ft. iron trestle. DISTRIBUTION.—Taps, 30; made by consumer for $3. Services, iron and lead; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 12. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $5,500, at 5%. Deficits are met by an extra 3-mill tax. MANAGEMENT.—Rept. by W. L. Burnett, July 29, '96. SEWERS.—None.

42. **DECORAH,** Winneshiek Co. (2,801.) Built in '81 by city. SUPPLY.—Surface wells, pumping to reservoir, with provision for direct pumping for fire protection. First well, 20 × 30 ft. PUMP.—Cap., 150,000 galls.; Knowles. RESERVOIR.—Cap., 400,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 75. Hydrants, 23. PRESSURE.—(In '88), 100 lbs. FINANCIAL.—Cost, $28,000. Expenses, Operating, $1,372. Revenue, $1,566. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 13, '88.

43. **DENISON,** Crawford Co. (1,782.) Built in '83 by town. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 850,000 (?) galls.: 250,000 and 100,000 dup., previously rept.; (Makers rept. 500,000 Barr). TANK.—Cap., 100,000 galls.; 30 × 20 ft., on 40-ft. tower; total height 125 ft. above town. DISTRIBUTION.—Mains, 2 miles. Taps, 95. Hydrants, 12. PRESSURE.—(In '88), 35 lbs. FINANCIAL.—Cost, $11,800. Bonded debt, $7,500, at 6%. Sinking Fund, $1,302. Expenses, $1,750: Operating, $1,300; int., $450. Revenue, Consumers, $600. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Sept. 20, '84.

44. **DES MOINES,** Polk Co. (50,093.) Built in '71 by Des Moines Water-Works Co., under perpetual charter. In '89, Co. bought out North Des Moines Water Co., which had just completed works to supply North Des Moines; by annexation North Des Moines is now part of Des Moines. FRANCHISE.—40 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $350 for public service (conditional). LEGAL DIFFICULTIES.—(Co. and city have been in litigation for some 5 yrs. over rates. City claimed right to regulate charges for public and private service under legislative act of '88, applying to cities of the first class. Co. contended that rates should be, as provided in original franchise, an average of those charged in other cities of the United States having efficient works operated by private companies. State Supreme Court has upheld city's right to regulate, but lower court has declared rates as established by city too low.—

Ed.) SUPPLY.—Filter galleries on Raccoon River, pumping to stand-pipe and direct. PUMPS.—Cap., 11,000,000 galls.: 6,000,000 Worthington hor. comp. cond.; 5,000,000 Holly-Gaskill hor. high duty. Semi-bituminous coal used; av. cost, $1 per short ton. STAND-PIPE.—Cap., 528,000 galls.; steel; 30 × 100 ft.; covered. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 82 miles. Taps, 5,000; made by consumer, no fee. Services, iron and lead; paid for by consumer. Meters: 2,136; owned by Co. and consumer; controlled and repairs paid by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 910. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 100 lbs.; fire, 140 lbs. FINANCIAL.—(In '90.) First cost, $350,000. Cap. Stock, $1,500,000. Debt, $825,000: Floating, $25,000; Bonded, $800,000, at 6%. Expenses, $68,000: Operating, $20,000; int., $48,000. MANAGEMENT.—Prest., F. M. Hubbell; Secy. and Mgr., A. N. Denman; Treas., H. D. Thompson. Rept. by Co., June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Oct. 22, '81; water rates, Feb. 27, '92, stand-pipe erection, Apr. 9, '92, illus.

45. **DE WITT**, Clinton Co. (1,859.) Built in '92 by city. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Drilled well, pumping to tank. PUMP.—Deep-well; from Contrs. TANK.—Cap., 45,000 galls.; on 60-ft. brick tower. DISTRIBUTION.—Mains, 1½ miles. FINANCIAL.—Cost, $10,000. NOTE.—Rept. by Contrs., for works as originally built.

46. **DOON**, Lyon Co. (Township, 716.) Built in '96-7 by city; will be completed about Apr. 1. Engr., L. E. Wakefield, Sioux City. Contrs., Fairbanks, Morse & Co., Chicago. SUPPPLY.—Surface well, 8 × 25 ft., pumping to tank. PUMP.—Cap., 500,000 galls.; Fairbanks-Morse dup. TANK.—Cap., 40,000 galls.; 18 × 20 ft., on steel tower 50 ft. high. DISTRIBUTION.—Mains, ⅔ mile. Hydrants, public, 8. FINANCIAL.—Cost, $8,000. MANAGEMENT.—Mayor, F. L. Jenkins; Recorder, A. N. Thompson. Rept. by Contrs., Dec., '96, and A. E. Kahl, Councilman, Nov., '96.

47. **DOWS**, Wright Co. (Est., 687.) Under construction in '97 by town. Des. Engrs., Crellin & Lovell; Contrs., Jackson & Moss; all of Des Moines. SUPPLY.—Deep well, pumping to tank. PUMP.—Wind mill. TANK.—Cap., 45,000 galls.; wood, on steel trestle 80 ft. high. DISTRIBUTION.—Mains, ½ mile. Hydrants, public, 9. FINANCIAL.—Cost, $4,700. Rept. by J. F. Kent, Nov., '96, and by Contrs.

48. **DUBUQUE**, Dubuque Co. (30,311.) Built in '71 by Dubuque Water Co. FRANCHISE.—Provides for purchase of works by city at any time at appraised value. Maximum rates are fixed in franchise. SUPPLY.—Abandoned tunnel for draining mines, by gravity to and from reservoir. Tunnel is about one mile long. RESERVOIR.—Cap., 1,600,000 galls.: 85 to 125 ft. above town; storage and distributing. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 26 miles. Hydrants, public, 233. PRESSURE.—(In '88), 40 lbs. FINANCIAL.—(In '90.) No debt. Expenses, taxes, $5,250. Revenue, City, $11,944. NOTE.—No rept. since '90-1 Manual except as to mains and hydrants. REFERENCE.—Eng. News, Nov. 19, '81.

49. **DUNLAP**, Harrison Co. (1,088.) Built in '95 by town. Contrs., Fremont (Neb.) Foundry & Machine Co. SUPPLY.—Well, 1,600 ft. deep, pumping to stand-pipe. PUMP.—Cap., 115,000 galls.; Cook. Bituminous slack used; av. cost, $1.90 per short ton. STAND-PIPE.—Cap., 32,000 galls.; iron; 10 × 50 ft., on hill, ¼ mile east of town. DISTRIBUTION.—Mains, about 1 mile. Taps, 20; made by town for $12.50. Services, lead; paid for by owner. Meters, 0. Hydrants, public, 8; private, 4. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, about, $6,000. Bonded debt at 5%. Expenses: Operating, about $500. MANAGEMENT.—Rept. by Town Recr., J. L. Pease, Jan. 23, '97. SEWERS.—None.

—? **DURANT**, Cedar Co. (505.) Built in '94 by city; put in operation in Dec. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Surface well, pumping to tank. PUMP.—Fairbanks-Morse, 6 × 18-in. direct-acting, operated by 7-HP. gasoline engine. TANK.—Cap., 63,000 galls.; pine, 20 × 24 ft., on wood tower 65 ft. high. DISTRIBUTION.—Hydrants, public, 8. Rept. by Contrs., Dec., '96.

50. **EAGLE GROVE**, Wright Co. (1,881.) Built in '95 by city; put in operation Mar. 1. Engrs., Iowa Engineering Co., Clinton. Contr., B. Schreiner, Des Moines. SUPPLY.—Artesian wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; American Well Works, dup. Bituminous slack used; av. cost, $1.60 per short ton. RESERVOIR.—Cap., 87,000 galls.; storage, 100 ft. from pump. STAND-PIPE.—Cap., 132,000 galls.; steel; 15' × 100 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 1 1-5 miles; cost extensions met by taxation. Taps, 21; made by city, free. Services, galv. i.; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 13; private, 4. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 40 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $16,000. Expenses: Operating, $1,000. Revenue: Consumers, $200. Deficits are met by taxation. MANAGEMENT.—Prest., G. H. Hutchings; Secy., Porter Donelly. Rept. by Supt., G. H. Carlton, June 13, '96. SEWERS.—Has sanitary and storm sewers.

—? **EARLY**, Sac Co. (277.) Rept. as having works.

—? **EDDYVILLE**, Wapello Co. (815.) Rept. as having works.

P 3. **ELBERON**, Tama Co. (Est., 280.) Rept. that bids for works would be received Mar. 20, '97. Mayor, Jno. Skrable.

51. **ELDON,** Wapello Co. (1,725.) Built in '93 by city. Contrs., Godfrey & Meals. SUPPLY.—Wells, pumping to reservoir. PUMP.—Cap., 300,000 galls.; Fairbanks. Bituminous lump coal used; av. cost, $1.75 per short ton. RESERVOIR.—Cap., 275,000 galls. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by appropriations. Taps, 25; made by consumer. Meters: 2; owned, controlled and repairs paid by town. Town cannot compel but may prohibit use of meters. Hydrants, public, 25. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $9,000. Bonded debt, $8,500, at 6%; due in 20 yrs. Revenue does not pay expenses. MANAGEMENT.—Mayor, D. A. Jay. SEWERS.—None.

52. **ELDORA,** Hardin Co. (1,577.) Built in '83 by city. SUPPLY.—Two wells, pumping to stand-pipe. Wells are in limestone; one 8 ins. × 250 ft., one 6 ins. × 200 ft. PUMP.—Cap., 100,000 galls.; deep well. Bituminous coal used; av. cost, $1.35 per short ton. STAND-PIPE.—Cap., 107,000 galls.; steel; 13½ × 100 ft., on 40-ft. timber trestle. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by general fund tax. Taps, 85; made by city for $3 each. Services, galv. i.; paid for by consumer. Meters, 2; owned, controlled and repairs paid by city; yearly rental, none. Use of meters optional with city; compulsory for electric light and motors purposes. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 25,000; max., 50,000; min., 15,000. PRESSURE.—Ordinary, 40 lbs.; fire, 42 to 100 lbs. FINANCIAL.—Cost, $20,000. Expenses: Operating, $1,300. MANAGEMENT.—Rept. by Supt., G. C. French, Aug. 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 17, '85.

P 4. **ELGIN,** Fayette Co. (369.) City thinks of building works, but has not authorized construction. Des. Engrs., Crellin & Lovell, Des Moines. Supply, well, pumping to reservoir. Est. cost, $6,000. Rept. by Chn. W.-W. Com., L. Y. Erich, Aug., '96.

53. **ELKADER,** Clayton Co. (745.) Built in '96 by city; put in operation Dec. 1. Engrs. and Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Flowing well, 180 ft. deep, discharging into collecting reservoir, thence pumping to distributing reservoir and direct. PUMP.—Cap., 288,000 galls.; Goulds, operated by 25-HP. Fairbanks-Morse gasoline engine. RESERVOIRS.—Cap., 225,000 galls.; collecting, 75,000; distributing, 150,000, half mile from and about 230 ft. above pump; about 150 ft. above business part of city. DISTRIBUTION.—Mains, 2.2 miles. Taps, 12. Meters, 0. Hydrants, public, 22. PRESSURE.—Ordinary, 99 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $11,160. MANAGEMENT.—Mayor, Chas. Reinecke; Recorder, G. M. Gifford; Supt., Ross Richardson. Rept. by Mayor, Dec. 16, '96.

54. **EMMETSBURG,** Palo Alto Co. (1,584.) Built in '90 by town; put in operation in Oct. SUPPLY.—Well, 8 ins. × 260 ft., pumping to stand-pipe. STAND-PIPE.—Cap., 70,000 galls.; 12½ × 80 ft. DISTRIBUTION.—Mains, ⅛ mile. Services, "only a few." Hydrants, public, 6. FINANCIAL.—Cost, $9,500. Bonded debt, $9,500, at 5%. MANAGEMENT.—Engr., Henry Kneer. Rept. by Mayor, L. Stuehmer, Sept. 26, '96.

55. **ESTHERVILLE,** Emmet Co. (1,475.) Built in '95 by city; put in operation Jan. 1. Engr., P. Canfield Barney, Chillicothe, Mo. Contrs., Hubbard Stone & Const. Co., Sioux Falls, S. Dak. SUPPLY.—Des Moines River and spring-fed reservoir, pumping direct. PUMPS.—Cap., 850,000 galls.; Deane comp. dup. Illinois bituminous coal used; av. cost, $3.95 per short ton. RESERVOIR.—Cap., 50,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 85; made by city. Services, galv. i.; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 18. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $15,000. Deficits met by special levy. Rept. by W. Comr., N. B. Egbert, July 27 '96. SEWERS.—None.

56. **FAIRFIELD,** Jefferson Co. (3,391.) Built in '83-4 by city and Geo. B. Inman. SUPPLY.—Impounding reservoir, pumping to stand-pipe and direct. PUMPS.—Cap., 2,500,000 galls.: 1,000,000 Blake; 1,500,000 Holly hor. dup. Bituminous coal used; av. cost, $1.20 per short ton. RESERVOIRS.—Cap., 100,000 galls.; area, about 20 acres. STAND-PIPE.—Cap., 75,000 galls.; iron. FISCAL YEAR CLOSED Mar. 16, '96. DISTRIBUTION.—Mains; cost extensions met by city. Taps, 305; made by city, free. Services, galv. i.; paid for by city. Meters, 12; owned, controlled and repairs paid by city; yearly rental, none. Use of meters compulsory for factories and steam users. City cannot compel but may prohibit use of meters. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 44,000. PRESSURE.—(In '88.) Ordinary, 27 lbs.; fire, 125 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $55,646. Debt, $38,151: Floating, $13,151; Bonded, $25,000, at 5%; due 1903. Expenses: Operating, $6,883; int., $849. Revenue: Consumers, $1,460. Deficits met by taxation; $4,405 raised by 5-mill tax in '95-6. MANAGEMENT.—Rept. by Supt., T. Y. Lynch, June 4, '96. SEWERS.—Has partial systems of sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 24, '85.

57. **FARMINGTON,** Van Buren Co. (1,002.) Built in '94 by town; put in operation Jan. 1. Engr., W. H. Jones, Keokuk. Contr., S. A. Bayer. SUPPLY.—Des Moines River, pumping to reservoir and direct. PUMP.—Cap., 500,000 galls.; Fairbanks, Morse & Co. Av. cost of coal used, 6 cts. per bushel. RESERVOIR.—Cap., 200,000 galls.; elev., 200 ft. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 2 miles. Services, galv. i.; paid for by consumer. Meters, 2; owned by town. Town cannot compel but may prohibit use of meters. Hydrants, public, 13; private,

110. CONSUMPTION.—(Galls.) av., 40,000; max., 70,000; min., 20,000. PRESSURE.—Ordinary, 97½ lbs.; fire, 150 lbs. FINANCIAL.—Cost, $8,700. Bonded debt, $6,000, at 6%; due Sept., 1903. Expenses: Operating, $600; int., $360. Revenue: Consumers, $1,300; City, none. MANAGEMENT.—Ch. Pump. Engr., O. S. Alfrey. Rept. by Mayor and Supt., W. D. McCormick, June 11, '96. SEWERS.—None.

58. **FONDA,** Pocahontas Co. (625.) Built in '95 by city; put in operation in Oct. Engrs., Crellin & Lovell, Des Moines. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Well, 200 ft. deep, pumping to tank. PUMP.—Cap., 50,000 galls. Av. cost of coal used, $1.20 per short ton. TANK.—Cap., 70,000 galls.; steel; 18 × 35 ft., on 65-ft. tower. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, ½ mile; cost extensions met by bonds. Taps, 50; made by town for $2.50. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 85,000. PRESSURE.—Ordinary, 40 lbs.; fire, 50 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $6,500, at 6%; due 1905. Expenses: Operating, $1,000; int., $390. Revenue, $1,200. MANAGEMENT.—Mayor, Jos. L. Mallison; Supt., R. F. Beswick. Rept. by Cy. Clk., M. G. Coleman, July 30, '96. SEWERS.—Has sanitary and storm sewers.

59. **FOREST CITY,** Winnebago Co. (895.) Built in '95 by city; completed in Aug. Engr., Chas. F. Loweth, St. Paul. Contrs., Crellin & Lovell, Des Moines. SUPPLY.—Filter gallery and river, pumping to stand-pipe, and direct, if desired. PUMP.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon; located in station of electric light co. and operated by it. STAND-PIPE.—Cap., 115,000 galls.; 14 × 100 ft. Contrs., Chicago Bridge & Iron Co. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, about $10,500. MANAGEMENT.—Rept. by Engr. (see above), in '96. SEWERS.—None.

60. **FORT DODGE,** Webster Co. (4,871.) Built in '80-1 by city; enlarged in '94 or '95. Engr., Chas. F. Loweth, St. Paul. SUPPLY.—Des Moines River, pumping direct. Filter gallery added in '94 or '95; located on island in river. PUMP.—Cap., 2,125,000 galls.: 1,000,000 Cope & Maxwell, rept. in '89; 1,125,000 Smedley, added in '94 or '95. TANK.—Cap., 100,000 galls.; steel; 25 × 20 ft., with hemispherical bottom; covered; on steel tower, top of tank being 116 ft. above ground. DISTRIBUTION.—(In '90.) Mains, 5.5 miles. Taps, 212. Hydrants, public, 42. PRESSURE.—(In '88.) Ordinary, 75 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Cost, $40,000. Bonded debt, $36,000, at 6%. Expenses, $7,245: Operating, $5,085; int., $2,160. Revenue, $7,673: Consumers, $4,072; City, fire protection, $3,001. NOTE.—No rept. since '90-1 Manual, except for improvements, as noted above. REFERENCE.—Eng. News, May 6, '82.

61. **FORT MADISON,** Lee Co. (7,901.) Built in '85 by Fort Madison Water Co.; rebuilt in '90. Press rept. states equity in plant was bought in Dec., '94, for $40,100 at sale to satisfy judgment for $254,313, in favor of Central Trust Co., of New York; purchase made by Wm. G. Pine Coffin, Newman Erb and Chas. F. Street, a committee of bondholders. FRANCHISE.—20 yrs. exclusive, from '85. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Cap., 4,500,000 galls.: 1,500,000 Blake comp. cond. dup.; 3,000,000 Worthington comp. non-cond. Makers also rept. 1,250,000 Worthington fire pump, possibly added since '89. RESERVOIRS.—Cap., 11,500,000; 1,5000,000 and 10,000,000. DISTRIBUTION.—(In '90.) Mains, 12 miles. Taps, 230. Meters, 14. Hydrants, public, 87. PRESSURE.—(In '88.) Ordinary, 70 lbs.; fire, 125 lbs. FINANCIAL.—(In '90.) Cost, $225,000. Cap. Stock: Paid-up, $150,000. Bonded debt, $150,000, at 6%. Expenses, $12,600: Operating, $3,900; int., $9,000. Revenue, $17,756: Consumers, $8,436; City, fire protection, $5,820; other purposes, $3,500. NOTE.—No official rept. since '90-1 Manual. Press rept., Jan., '97, stated Co. was about to let contract for 1,400,000-gall. reservoir to receive water from two new artesian wells, and that Pohle air-lift used to test wells would be retained for lifting water to new reservoir.

62. **GALVA,** Ida Co. (Township, 732.) Built in '96 by city; put in operation Sept. 25. Engrs. and Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Well, pumping to stand-pipe and direct. PUMP.—Cap., 1,440,000 galls. Illinois bituminous coal used; av. cost, $6 per short ton. STAND-PIPE.—Cap., 37,000 galls.; 12½ × 40 ft. high, on hill. FISCAL YEAR CLOSED '95. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by issuing bonds. Taps, 2; made by city for $5. Services, various materials; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 6. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $3,300. Bonded debt, $3,300, at 6%; due in 20 yrs. MANAGEMENT.—Rept. by Cy. Clk., M. H. Ward, Nov. 22, '96.

63. **GARNER,** Hancock Co. (679.) Built in '91 by town; put in operation in Dec. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Wells, pumping to tank. PUMP.—Driven by windmill, with auxiliary gasoline engine. TANK.—Cap., 56,000 galls.; wood; on frame trestle 60 ft. high, near wells. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by property owners. Taps, 20; made by town and cost credited to water account of consumer. Services, galv. i.; paid for by consumer. Town can compel use of meters. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 8,000; max., 10,000; min., 6,000. FINANCIAL.—Cost, $8,000. Expenses: Operating, $200. Revenue: Consumers, $250. A 3-mill tax is levied annually to meet int. and expenses. MANAGEMENT.—Supt., H. S. Nelson. Rept. by M. R. Chambers, Dec. 21, '96. SEWERS.—Partial storm sewers only.

64. **GLADBROOK,** Tama Co. (556.) Built in '83 by town. SUPPLY.—Artesian well, pumping to tank. Well is 2¼ in. diam., 216 ft. deep. PUMPS.—Cap., 4,000 galls.; windmill. TANK.—Cap., 30,000 galls.; 18 × 16 ft., 40 ft. above pumps. DISTRIBUTION.—Mains, 2.9 miles. Taps, 9. Hydrants, public, 3. FINANCIAL.—Cost, $3,600. Debt, $2,500, at 6%. Expenses, $250: Operating, $100; int., 150. NOTE.—No rept. since '90-1 Manual. REFERENCE,—Eng. News, Feb. 14, '85.

65. **GLENWOOD,** Mills Co. (1,890.) Built in '93 by city; put in operation May 4. Contrs., Churchill Pump Co., Omaha. SUPPLY.—Drilled well, pumping to stand-pipe and direct. Water vein used is 1,780 ft. below surface. PUMP.—Smith-Vaile deep-well pump. Av. cost of coal used, $3.25 per short ton. TANK.—Cap., 33,000 galls.; steel; 12 × 40 ft., on concrete foundation. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 1.8 miles; cost extensions met by public funds. Taps made by city for $10. Services, galv. i.; paid for by consumer. Meters, 50; owned by consumer; controlled by city; repairs paid by city. Use of meters optional with city; compulsory for all consumers except a few who made contracts before meters were used. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 27,500; max., 40,000; min., 15,000. PRESSURE.—Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $10,000, at 6%; due in yearly installments of $600. Expenses: Operating, $1,200; int., $708. Revenue: Consumers, metered, $600; City, none. Deficits met by a 5-mill tax. MANAGEMENT.—Mayor, T. L. Stephens; Supt., J. G. Lewis. Rept. by Seth Dean, June 16, '96. SEWERS.—None.

66. **GRANVILLE,** Sioux Co. (Est., 373.) Built in '96 by city; put in operation Nov. 1. Engr., F. E. Wade, Sheldon. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Well, pumping to tank. PUMP.—Driven by windmill. TANK.—Cap., 48,000 galls.; cypress; 18 × 22 ft., on steel tower 60 ft. high. DISTRIBUTION.—Mains, ⅛ mile. Taps made by town for $12, including service to curb. Hydrants, public, 3. FINANCIAL.—Cost, $3,400. Debt, $9,500: Floating, $8,000, at 6%. Bonded, $1,500, at 6%; due in 10 yrs. Revenue, $900. MANAGEMENT.—Mayor, P. B. Vosburg; Recorder, N. H. Graff. Rept. by Contrs., Dec., '96. SEWERS.—None.

—? **GREENE,** Butler Co. (845.) Rept. as having works.

67. **GRINNELL,** Poweshiek Co. (3,332.) Built in '94 by city; put in operation in Aug. Engr., Geo. C. Morgan, Chicago, Ill. SUPPLY.—Well, 2,002 ft. deep, pumping to tank and direct. PUMPS.—Cap., 1,440,000 galls.; Knowles. Bituminous slack used; av. cost, $1.10 per short ton. RESERVOIR.—Cap., 90,000 galls.; storage, at pumping station. TANK.—Cap., 32,000 galls.; steel; 10 × 48 ft., on brick tower 68 ft. high. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by revenue. Taps, 205; made by consumer at a cost of $2.65 for ¾-in. tap, no fee. Services, galv. i.; paid for by consumer. Meters, 200; owned and controlled by city; repairs paid by consumer; yearly rental, none. Use of meters compulsory for all consumers. Hydrants, public, 50. PRESSURE.—Ordinary, 40 lbs.; fire, 150 lbs. Steam fire engines are used. FINANCIAL.—Cost, $80,000. Debt, $32,000: Floating, $2,000, at 5%. Bonded, $30,000, at 5%. Expenses: Operating, $2,300; int., $1,600. Revenue, $2,760: Consumers, metered, $1,600; City, fire protection, $960; street sprinkling, $100; other purposes, $100. Deficits are met by taxation. MANAGEMENT.—Prest., E. W. Clark; Supt., C. H. Verbeck. Rept. by Secy., J. F. Wilson, July 9, '96. SEWERS.—Has sanitary and storm sewers.

68. **GRISWOLD,** Cass Co. (752.) Built in '95 by city; put in operation July 1. Engrs., Andrews & Burrell, Fremont, Neb. Contrs., Fremont (Neb.) Foundry & Machine Co. SUPPLY.—6-in. driven well, pumping to stand-pipe. Bituminous coal used; av. cost, $1.75 per short ton. STAND-PIPE.—Cap., 58,000 galls.; 10 × 100 ft., on concrete foundation. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 1 mile. Taps, 25. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 11. FINANCIAL.—Debt, $11,000: Floating, $6,250; Bonded, $4,750, at 5%. Rept. by H. A. Briggs, Mayor, Aug. 11, '96. SEWERS.—None. REFERENCE.—Stand-pipe, Eng. News, May 2, '95.

69. **GRUNDY CENTRE,** Grundy Co. (1,161.) Built in '94 by town; put in operation Jan. 1. Engr. and Contr., J. L. Turner, Des Moines. SUPPLY.—Deep well, pumping to stand-pipe. PUMP.—Cap., 216,000 galls.; Bradford. Av. cost of coal used, $3 per short ton. STAND-PIPE.—Cap., 84,000 galls.; steel; 12 × 100 ft., on stone foundation. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 2½ miles. Taps, 85; made by city. Services, galv. i.; paid for by consumer. Meters, 11; 8 owned by consumer, 3 by city; controlled by city. Use of meters compulsory for hotels, creamery and livery stables. City can compel use of meters and any consumer may have one. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 9,000. PRESSURE.—Ordinary and fire, 57 lbs. FINANCIAL.—Cost, $13,750. Bonded debt, $11,000, at 5%; due 1904. Expenses: Operating, $1,750. Revenue, $750. Deficit of $1,000 met by taxation. MANAGEMENT.—Rept. by J. D. Burns, July 27, '96. SEWERS.—None.

70. **GUTHRIE CENTER,** Guthrie Co. (1,037.) Built in '90 by town. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Smedley hor. dup. STAND-PIPE.—Cap., 25,000 galls.; 18 × 25 ft. DISTRIBUTION.—Mains, 1 mile. Taps, 130. Hydrants, public, 12. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.

—Cost, $7,625. Bonded debt, $9,000, at 6%. Expenses, $1,205: Operating, $540; int., $665. NOTE.—No rept. since '90-1 Manual.

71. **GUTTENBURG,** Clayton Co. (1,160.) Built by city; put in operation Jan. 1, '94. Engr., A. Parish, Morrison, Ill. Contr., Mat. C. Burke, West Superior, Wis. SUPPLY.—Mississippi River, pumping from infiltration well to reservoir. PUMP.—Cap., 750,000 galls.; Worthington comp. non-cond. Wood used mostly; av. cost, $1.75 per cord. RESERVOIR.—Cap., 160,000 galls.; covered; located 286 ft. above city. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 1.7 miles; cost extensions met by city. Taps, about 50; made by licensed plumber. Services, iron and lead; paid for by owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., about 10,000. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $12,500. Bonded debt, $8,000, at 5%. Expenses, $570: Operating, $170; int., $400. Revenue, $200: Consumers, unmetered, about $50; street sprinkling, $100; public buildings, $50. Deficits are met by taxation. MANAGEMENT.—Recorder, A. Kappan; Ch. Pump. Engr., Henry Dadcke. Rept. by Wm. Nolte, Ch. of Fire Dept., Dec. 14, '96. SEWERS.—None.

72. **HAMBURG,** Fremont Co. (1,634.) Built in '90-1 by city; put in operation in spring or '91. Engr., E. A. Rudiger. SUPPLY.—Springs, well and stream, pumping to reservoir. PUMP.—Cap., 240,000 galls.; Smith-Vaile. FILTER.—Jewell. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 1½ miles. Taps, 90. Services, ¾-in. galv. 1. Meters, 12. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $14,000, at 6%. Expenses: Operating, $800. MANAGEMENT.—Rept. by Supt., F. L. Fisher, Jan. 20, '97. SEWERS.—None.

73. **HAMPTON,** Franklin Co. (2,067.) Built in '91 by city; put in operation May 1. Engr., Geo. W. Wynn, Cedar Rapids. No contr. SUPPLY.—Spring, pumping from storage reservoir to stand-pipe. PUMPS.—Cap., 864,000 galls.; 2—432,000. Bituminous pea coal used; av. cost, $1.65 per short ton, delivered. RESERVOIR.—Cap., 472,500 galls.; storage, ¾ mile from city. STAND-PIPE.—Cap., 64,000 galls.; steel; 10 x 110 ft. FISCAL YEAR CLOSED Mar. 17. DISTRIBUTION.—Mains, 1¾ miles; cost extensions met by property owners. Taps, 130; made by city for $5, including goose-neck. Services, iron; paid for by property owner. City can compel use of meters and any consumer may have one at his own expense. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 125,000; max., 150,000; min., 100,000. PRESSURE.—Ordinary, 65 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $15,000, at 5%; due in 5 to 20 yrs. Expenses: Operating, $1,383; taxes, $1,378. Revenue: Consumers, $1,749; City, street sprinkling, $105. Deficits are met by city tax. MANAGEMENT.—Mayor, Frank Kratochvil; Ch. Pump. Engr., John Raishan. Rept. by Supt., E. C. Grevelle, June 16, '96. SEWERS.—None. REFERENCE.—Stand-pipe accident, Eng. News, Apr. 25, '95.

74. **HARLAN,** Shelby Co. (1,765.) Built in '91 by town. SUPPLY.—Tube wells, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; 500,000 Worthington comp. non-cond.; 500,000 Barr. STAND-PIPE.—Cap., 45,000 galls.; 10 x 75 ft. DISTRIBUTION.—Mains, 1½ miles. Taps, 100. Hydrants, public, 18. PRESSURE.—(In '91.) Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $19,000. MANAGEMENT.—Chm. W.-W. Com., D. Z. Ganser. Rept. by Cy. Clk., M. Frets, Sept. 20, '96.

P 5. **HARTLEY,** O'Brien Co. (519.) Well was under construction in '96. Mar. 1, '97, F. E. Wade, Engr., rept. he had completed plans and that contracts would be let soon.

75. **HAWARDEN,** Sioux Co. (744.) Built in '90 by town; put in operation Sept. 15. SUPPLY.—Driven wells, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; National Brass & Iron Works, Dubuque. TANK.—Cap., 60,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 75. Meters, 75. Use of meters compulsory for all consumers. Hydrants, public, 6. PRESSURE.—Ordinary, 50 lbs.; fire, 112 lbs. FINANCIAL.—Cost (in '90), $8,000. MANAGEMENT.—Supt., F. C. Swanton.

F 3, P 6. **HOLSTEIN,** Ida Co. (539.) Built in '96 by town for fire protection. Supply, well, pumping to tank on trestle. Mains, 1 mile. Hydrants, public, 9. Pressure, 25 to 150 lbs. Steam fire engines are used. Bonded debt, $3,000, at 6%. Rept. by Wm. Schippmennd, June 5, '96. Upon completion of an artesian well, now 1,600 ft. deep, plant will be extended for domestic supply also.

76. **HUBBARD,** Hardin Co. (452.) Built in '92 by city; put in operation Nov. 20. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Open well, pumping to tank. PUMP.—Driven by windmill; also steam pump. TANK.—Cap., 50,000 galls.; on frame tower 60 ft. high. DISTRIBUTION.—Mains, ½ mile; cost extensions met by order of council. Taps, 8. Services paid for by property owner. Meters, 1; owned by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 4. CONSUMPTION.—(Galls.) max., 200; min., 50. FINANCIAL.—Cost, $5,000. Bonded debt, $6,500, at 6%; due in 20 yrs. Expenses: Operating, about $200. Revenue: Consumers, unmetered, $65; metered, $20. MANAGEMENT.—Rept. by J. P. Winters, Ch. Fire Dept., Jan. 12, '97. SEWERS.—None.

F 4. **HULL,** Sioux Co. (566.) Built by city in '96 for fire protection only. Supply, deep well, lifted by 72,000-gall. Cook pump to elevated tank. Mains, ¼ mile. Hydrants, 4. Pressure, 80 lbs. Cost, $5,000. Rept. by B. H. Tampla, Oct. 23.

77. **HUMBOLDT,** Humboldt Co. (Est., 1,240.) Built in '90 by city. SUPPLY.—Spring and river, pumping to reservoir and direct. PUMPS.—Cap., 266,000 galls.; Deane dup. RESERVOIR.—Cap., 112,000 galls.; 70 ft. above town. DISTRIBUTION.—(In '90.) Mains, 1 mile. Taps, 27. Hydrants, public, 8. FINANCIAL.—(In '90.) Cost, $10,000. Bonded debt, $10,000, at 5½%. NOTE.—No rept. since '90-1 Manual.

78. **IDA GROVE,** Ida Co. (1,563.) Built in '82 by town. SUPPLY.—Driven well, pumping to tank. PUMPS.—Cap., 90,000 galls.; windmill, with Knowles steam for emergency. TANK.—Cap., 100,000 galls.; wood; 30 × 20 ft., on 20-ft. timber trestle. DISTRIBUTION.—Mains, 2 miles. Hydrants, 13. FINANCIAL.—Cost, $13,000. Bonded debt, $7,500, at 5%. Expenses, $1,375: Operating, $1,000; int., $375. Revenue, $1,100. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 28, '85.

79. **INDEPENDENCE,** Buchanan Co. (3,163.) Built in '86-7 by town. SUPPLY.—Driven wells and Wapsipinicon River, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Smedley comp. cond. dup. DISTRIBUTION.—Mains, 5 miles. Taps, 200. Meters, 89. Hydrants, public, 40. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 5%. Sinking Fund, $5,332. Expenses, $5,120: Operating, $3,120; int., $2,000. Revenue, $5,917. NOTE.—No rept. since '90-1 Manual.

80. **INDIANOLA,** Warren Co. (Est., 2,825.) Built in '95 evidently by city and Co., jointly, under arrangement by which city will eventually own works. Contr. (?), Geo. C. Morgan, New York Life Bldg., Chicago. SUPPLY.—28 wells, pumping to tank. PUMPS.—Cap., 2,500,000 galls.; two Deane dup. (rept. by makers). TANK.—Cap., 40,000 galls.; 12 × 48 ft., on 68-ft. brick tower. NOTE.—Information mostly from press repts.

81. **IOWA CITY,** Johnson Co. (7,016.) Built in '82 by Iowa City Water Co. FRANCHISE.—20 yrs. from '82; does not provide for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Iowa River, pumping direct from filtering gallery in bed of river. PUMPS.—Cap., 2,500,000 galls.: 1,500,000 Holly quadruplex; 1,000,000 Holly hor. dup. Bituminous slack coal used; av. cost, $1.30 per short ton. FILTER GALLERY.—(Press rept. in '95.) Length, 480 ft.; 350 ft. of crib and 130 ft. of arched gallery, 12 × 12 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 10¾ miles. Taps, 580; made by consumer, no fee. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 130. CONSUMPTION.—(Galls.) av., 815,210; max., 1,238,460; min., 701,800. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Bonded debt, $82,000, at 6%. Expenses, $11,270: Operating, $5,480; int., $4,920; taxes, $870. Revenue: City, fire protection, $6,400. MANAGEMENT.—Prest., A. B. Brown; Secy. and Treas., Robt. L. Thompson, both of Muscatine. Rept. by Supt., Jay Chatham, July 18, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 15, '83.

82. **JEFFERSON,** Greene Co. (1,875.) Built in '94 by city; put in operation in Dec. Engrs., U. S. Wind Mill Co., Batavia, Ill. Contr., J. L. Black. SUPPLY.—Deep well, 2,100 ft. deep, pumping to tank. TANK.—Cap., 100,000 galls.; on steel tower 120 ft. high. FISCAL YEAR CLOSED Apr. 9. DISTRIBUTION.—Mains, 2¾ miles; cost extensions met by city from general fund. Taps, 180; made by consumer by licensed plumbers, who pay $25 yearly license fee. Services, galv. i.; paid for by consumer. Meters, 10; owned and repairs paid by consumer; controlled by city. Hydrants, public, 21; private, 1. CONSUMPTION.—(Galls.) av., 30,000; max., 40,000; min., 20,000. PRESSURE.—Ordinary, 60 lbs. Water tax of 5 mills on all property protected is provided for by statute. MANAGEMENT.—Rept. by Water Comr., M. E. Hall, June 25, '96. PROJECTED IMPROVEMENTS.—15 × 65-ft. well and dup. pump or 225,000-gall. air-lift pump. Press rept., Mar., '97, stated "steam head pump" of 720,000-gall. cap. had been installed. SEWERS.—Has storm sewers only.

—? **KELLOGG,** Jasper Co. (700.) Rept. as having works.

83. **KEOKUK,** Lee Co. (14,101.) Built in '77-8 by Keokuk Water-Works Co.; controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—(In '90.) 20 yrs.; does not provide for purchase of works by city. Maximum rates are fixed in franchise. SUPPLY.—Mississippi River, pumping direct; filtered. PUMPS.—Cap., 9,000,000 galls.: 4,000,000 Holly-Gaskill hor. high duty; 1,500,000 Holly quadruplex; 2—1,750,000 Deane comp. dup. cond. FILTERS.—Cap., 8,000,000 galls.; New York. DISTRIBUTION.—Mains, 20 miles. Hydrants, public, 124. PRESSURE.—Ordinary, 90 lbs.; fire, 110-120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy., J. F. Cockburn; Treas., W. B. Dunbar; Supt., D. W. Swarts. Rept. by Am. W.-W. & Guar. Co., Aug. 20, '96. REFERENCE.—Eng. News, Jan. 14, '82.

P 7. **KEOSAQUA,** Van Buren Co. (831.) City expects to build in '97. Engr., Chas. F. Sturtevant, St. Louis. Contract let in July, '96, to Parks & Wilkin, for $8,750. Supply, river, by pumping. Press rept., Mar., '97, stated contract had just been signed and money secured. Address W. A. Duckworth.

84. **KINGSLEY,** Plymouth Co. (649.) Built in '94 by town. Engrs., Howe Pump & Engine Co. SUPPLY.—Large well, 22 ft. deep, pumping to tank. PUMP.—Operated by gasoline engine. TANK.—Cap., 40,000 galls.; wood; 18 × 22 ft., on iron posts 30 ft.

high. DISTRIBUTION.—Taps made by city. Services, ¾-in.; paid for by city to curb. Use of meters optional with consumer. Hydrants, public, 13. FINANCIAL.—Cost, $5,870. Bonded debt, $6,000, at 6%, due in 1905. MANAGEMENT.—Supt., J. N. Butler; Ch. Pump. Engr., D. A. Ollmar. Rept. by Secy., J. F. Vanier, Aug. 12, '96. SEWERS.—None.

85. **KNOXVILLE,** Marion Co. (2,632.) Built in '87 by town. SUPPLY.—River, pumping to distributing reservoir and stand-pipe. PUMPS.—Cap., 950,400 galls.; 518,400 Blake dup. and 432,000 Knowles dup. Bituminous coal used; av. cost. $1.50 per short ton. RESERVOIR.—Cap., 7,000,000 galls. STAND-PIPE.—Cap., 105,000 galls.; steel, 12 × 125 ft. FISCAL YEAR CLOSED in Mar. DISTRIBUTION.—Mains, 6.3 miles; cost extensions met by special tax and revenue. Taps, 200; made by city for $1. Services, galv. 1.; paid for by consumer. Meters: 20; owned and repairs paid by consumer; controlled by city. Use of meters compulsory for steam users, liveries and barber shops. City can compel use of meters and any consumer may have one. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $40,000. Debt, $39,860: Floating, $2,500, at 6%; Bonded, $16,860, at 5%, due in 1907; $15,000, at 5%, due in 1910; $5,500, at 6%, due in 1908. Sinking Fund, none. Expenses, Operating, $2,000. Revenue, Consumers, $1,800. Deficits are met entirely by taxation. MANAGEMENT.—Rept. by Supt., T. G. Gilson, June 10, '96. SEWERS.—None.

86. **LAKE CITY,** Calhoun Co. (1,160.) Built in '93 by city. Contrs., A. F. Paige & Co. SUPPLY.—Well, 5-ins. × 210 ft., pumping to stand-pipe. PUMPS.—Cap., 108,000 galls. Av. cost of coal used, $2 per short ton. STAND-PIPE.—Cap., 67,000 galls.; 12 × 80 ft., steel. FISCAL YEAR CLOSED in Mar. DISTRIBUTION.—Mains, 1.5 miles. Taps, 100; made by consumer for $9. Services, iron; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 18. FINANCIAL.—Cost, $14,000. Bonded debt, $11,500, at 6%. Sinking Fund, $500. Revenue, Consumers, $1,300. MANAGEMENT.—Mayor, A. H. Grant. Ch. Pump. Engr., C. Hatford. Rept. by Mayor. SEWERS.—Has sanitary and storm sewers.

87. **LAKE MILLS,** Winnebago Co. (604.) Built in '96 by city. SUPPLY.—Deep well, pumping to tank. PUMPS.—Gordon. TANK.—Cap., 41,800 galls.; wood, 18 × 22 ft., on 70-ft. tower. FISCAL YEAR CLOSES Apr. 1, '97. DISTRIBUTION.—Mains, "six blocks." Hydrants, public, 6. FINANCIAL.—Cost, $5,000. Debt, $5,000: Floating, $800; Bonded, $4,200, at 6%, due in 20 yrs. No sinking fund. Expenses, Operating, $400. MANAGEMENT.—Rept. by O. N. Styre, Jan. 17, '97.

—? **LAKE VIEW,** Sac Co. (366.) Built in '94 or '95, a press rept. Nov. 20, '95, stating that $3,000 20-yr. bonds had been issued for works to be put in that fall, and that but two hydrants would be placed. Sept., '96, F. H. Taylor, Mayor, rept.: "System is in and paid for."

88. **LANSING,** Allamakee Co. (1,688.) Built in '77 by Lansing Artesian Well Co. FRANCHISE.—25 yrs. from '77; does not provide for purchase of works by city. Rates are fixed in city ordinance. Co. is not exempt from local taxes. City to pay $350 per yr. for 10 hydrants. No legal difficulties. SUPPLY.—Two artesian wells, with head of 40 to 45 ft. above street level, by gravity. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by surplus fund. Taps, 50; made by consumer. Services, lead and galv. 1.; paid for by consumer. Meters, 0. Hydrants, public, 10; private, 1. Steam fire engines are used. FINANCIAL.—Cost, $10,000. Cap. Stock: Authorized, $25,000; paid-up, $4,240; paid 10% div'd in '95. No debt. Surplus Fund: $600, deposited in bank at 4%. Expenses: Operating, $80; taxes, $58. Revenue, $697: Consumers, unmetered, $387; City, fire protection, $310. MANAGEMENT.—Prest., M. Kerndt; Supt., E. Boackh. Rept. by Secy. and Treas., B. T. Thomas, June 4, '96. SEWERS.—Has partial system of sanitary and storm sewers.

89. **LA PORTE CITY,** Blackhawk Co. (1,052.) Built in '96 by La Porte City Electric Light & Water Co.; put in operation in July. Engrs. and Contrs., Jackson & Moss, Des Moines. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city every five yrs., beginning with 1905. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $530 per yr. No legal difficulties. SUPPLY.—Four 25-ft. driven wells, pumping to tank. PUMP.—Cap., 1,000,000 galls.; Buffalo. Bituminous coal used; av. cost, $2 per short ton. TANK.—Cap., 60,000 galls.; wood; 20 × 24 ft., on steel tower 90 ft. high. FISCAL YEAR CLOSED Aug. 15. DISTRIBUTION.—Mains, 2 miles; cost extensions met by loans. Taps, 40; made by Co. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 21. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. Steam fire engines are used. FINANCIAL.—Cost, $21,000 (includes electric light plant). Cap. Stock: Authorized, $35,000; paid-up, $15,000. Paid no div'd in '95. Floating debt, $8,000, at 7% and 8%. Expenses, Operating, $1,270. MANAGEMENT.—Prest. and Supt., W. D. Wagoner; Ch. Pump. Engr., Geo. Husman. Rept. by Secy. and Treas., A. Van Valkenburg, Sept. 2, '96. SEWERS.—None.

—? **LAURENS,** Pocahontas Co. (318.) Built since '91. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill.

F 5. **LAWLER,** Chickasaw Co. (464.) Built in '96 by city; put in operation Oct.

15. Engr., W. H. Garrett, Batavia, Ill. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Drilled well, pumping to tank. PUMP.—Cap., 72,000 galls.; deep-well, driven by 7-HP. Fairbanks-Morse gasoline engine. TANK.—Cap., 35,000 galls.; soft pine, 20 × 18 ft., on brick tower 75 ft. high. DISTRIBUTION.—Mains, 2,000 ft. Taps, 10. Hydrants, public, 5. FINANCIAL.—Cost, $5,000. MANAGEMENT.—Mayor, Wm. Lawrence; Supt., T. E. Sherwood. Rept. by Contrs., Dec., '96, and local officials.

90. **LE MARS,** Plymouth Co. (4,036.) Owned by Le Mars Water & Light Co. Built in '88-9 by J. M. Dunn; bought in '90 by J. H. Winchell, who organized Northwestern Water & Light Co. in '93. In Apr., '96, property was sold by sheriff for $43,000, and $23,290 paid to satisfy holders of second mortgage bonds, balance going to stockholders. Jno. F., W. J. and Cora E. Rogers incorp. Le Mars Water & Light Co., May, 96. (Press repts.) SUPPLY.—Driven wells, pumping direct and from reservoir in case of fire. In '93, there were 55 wells, each about 70 ft. deep (press rept.). PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Holly comp. dup. RESERVOIR.—Cap., 250,000 galls. Press rept., Jan., '93, stated there was a 1,500,000-gall. reservoir. DISTRIBUTION.—(Press rept., Jan., '93.) Mains, 15 miles. Taps, 700. Meters (in '90), 4. Hydrants, 75. PRESSURE.—(In '89.) Ordinary, 60 to 80 lbs.; fire, 100 to 120 lbs. FINANCIAL.—Cost, $63,446. No Cap. Stock. Bonded debt, $40,000, at 6%, due in '93. Expenses, $5,400: Operating, $3,000, int., $2,400; taxes, none. Revenue, $6,484: Consumers, $3,549; City, fire protection, $2,560; other purposes, $375. NOTE.—No official rept. since '90-1 Manual.

91. **LEWIS,** Cass Co. (579.) Built in '90-1 by city. Engrs. and Contrs., Fairbanks, Morse & Co., Chicago or St. Paul. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 25,200 galls. Av. cost of coal used, $2.50 per short ton. TANK.—Cap., 34,000 galls.; wood. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, ½ mile; cost extensions met by sale of bonds. Taps made by consumer. Services, iron; paid for by consumer. Meters: 50; owned by city; controlled by city; repairs paid by consumer. City can compel use of meters and any consumer may have one. Hydrants, public 20. CONSUMPTION.—(Galls.) av., 9,000; min., 7,000. FINANCIAL.—Cost, $5,000. Bonded debt, $5,000, at 6%; due in 10 to 20 yrs. Sinking Fund: $500, invested in real estate. Expenses: Operating, $300; int., probably $300, mentioned above. Revenue: Consumers, unmetered, $300; metered, $250; City, fire protection, $1,500; public buildings, $500. Deficits met by general taxation. MANAGEMENT.—Secy., G. W. B. Fletcher. Rept. by Oliver Mills, Mayor. SEWERS.—None.

92. **LISBON,** Linn Co. (1,079.) Built in '95 by city; put in operation in May. Engr., P. C. Barney, Chillicothe, Mo. Contrs., Smedley Mfg. Co., Dubuque. SUPPLY.—Springs, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; Smedley comp. dup. Bituminous nut coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 36,000 galls.; collecting at springs. TANK.—Cap., 36,000 galls.; 12½ × 40 ft., on 50-ft. brick tower; Contrs., Crellin & Lovell, Des Moines. FISCAL YEAR CLOSED Feb. 15. DISTRIBUTION.—Mains, 1.4 miles; cost extensions met by city. Taps, 45; made by city at $4 for ¾-in. and $5.25 for 1-in. tap, including cock and goose-neck. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 13; private, 45. CONSUMPTION.—(Galls.) av., 12,000; max., 18,000; min., 6,000. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, about $12,000. Following are for combined water and electric light plant: Bonded debt, $13,000, at 5%, due in 20 yrs., payable at option of town after 5 yrs.; City warrants outstanding, $4,000, at 6%. Expenses: Operating, $1,500; int., $890; taxes, $3,000. Revenue, $2,800, from water and light plants. MANAGEMENT.—Secy., Sol. Kettering; Ch. Pump. Engr. and Electrician, E. W. McFarland. Rept. by Mayor and Supt., W. H. Runkle, June 11, '96. SEWERS.—None.

—? **LIVERMORE,** Humboldt Co. (459.) Rept. as having works.

93. **LOGAN,** Harrison Co. (827.) Built in '84 by village. SUPPLY.—Well, in rock, 30 × 30 ft., pumping direct. PUMP.—Cap., 500,000 galls.; Barr. Pumping is done by electric light Co. RESERVOIR.—Cap., 94,000 galls., 100 ft. above street grade. DISTRIBUTION.—Mains, 1¾ miles; cost extension was met by additional bonds. Taps, 25; made by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 15,750. PRESSURE.—Ordinary, 80 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $9,000: $4,000 at 7%, due in 1914; $5,000, at 5%; due in 1915. Sinking Fund: $160, not invested. Expenses, $1,230: Operating, $700; int., $530. Revenue, Consumers, unmetered, $250. Deficit amounting to $980 was paid out of general fund. MANAGEMENT.—Ch. Pump. Engr., Sam'l Wallace. Rept. by Supt., V. M. Kirkendall, Sept. 19, '96. SEWERS.—None.

94. **LOHRVILLE,** Calhoun Co. (485.) Built in '96 by city; put in operation Dec. 20. Engr., W. H. Garrett, Batavia, Ill. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Drilled well, 200 ft., deep, pumping to tank. PUMP.—Cap., 72,000 galls.; deep-well pump, driven by 7-HP. Fairbanks-Morse gasoline engine. TANK.—Cap., 44,000 galls.; cypress; 20 × 20 ft., on 4 post steel tower 60 ft. high. DISTRIBUTION.—Mains, ⅛ mile. Water is furnished for domestic use. Hydrants, public, 5. FINANCIAL.—Cost, $5,000. MANAGEMENT.—Mayor, M. T. Patton; Recorder, W. J. Gillam. Rept. by Contrs., Dec., '96.

—? **LORIMOR,** Union Co. (Est., 488.) Built since '91. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill.

82. **LYONS,** Clinton Co. See Clinton.

F 6, P 8. **M'GREGOR,** Clayton Co. (1,160.) Built by McGregor Artesian Well Co. for fire protection only. Supply, flowing artesian wells. Town has sanitary and storm sewers. Rept. by C. W. Walker, Mayor, June 5, '96. Press repts. stated city would vote, Jan. 25, '97, on building works; and that C. F. Loweth, St. Paul, has been engaged to make plans. Est. cost., $17,000.

95. **MALCOM,** Poweshiek Co. (372.) Built in '95 by town; put in operation Dec. 15. Engrs. and Contrs., Jackson & Moss, Des Moines. SUPPLY.—Surface wells, pumping to tank. PUMP.—A 5 × 8-in. Goulds triplex, driven by 12-HP. gasoline engine. TANK.—Cap., 40,000 galls.; wood; on steel trestle 70 ft. high. DISTRIBUTION.—Mains, 1¼ miles. Taps, 36. Services, galv. 1. Hydrants, public, 8. FINANCIAL.—Cost, $6,000. Rept. by Contrs., Feb. 15, '97. SEWERS.—None.

96. **MALVERN,** Mills Co. (1,003.) Built in '91 by city. SUPPLY.—Driven wells, pumping to tank. PUMP.—Operated by Malvern Light & Power Co. Bituminous lump coal used; av. cost, $2.15 per short ton. TANK.—Cap., 87,000 galls.; wood. DISTRIBUTION.—Taps, 45. Services paid for by property owner. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., $9,450. FINANCIAL.—Cost, $8,000. Rept. by L. W. Boehner, Sept. 7, '96. SEWERS.—None.

97. **MANCHESTER,** Delaware Co. (2,344.) Built in '90 by city. Engr. and Contr., E. Smedley, Dubuque. SUPPLY.—Spring, for domestic use, river for fire protection, pumping to stand-pipe. PUMPS.—(In '90.) Cap., 1,500,000 galls.; 2—750,000 Smedley. STAND-PIPE.—(In '90.) Cap., 105,000 galls.; 15 × 80 ft. FISCAL YEAR CLOSED Mar. 12. DISTRIBUTION.—Taps, 250; made by city for $1.50. Services, lead or iron; paid for by property owner. Meters, 17; owned, controlled and repairs paid by city; yearly rental, $3. Use of meters compulsory for large consumers. City can compel use of meters, and any consumer may have one. Hydrants, public, 33. PRESSURE.—(In '90.) Ordinary, 55 lbs.; fire, 90 to 100 lbs. FINANCIAL.—Cost (in '90), $24,000. Bonded debt, $21,700: $20,000, at 5%, due in 10 to 20 yrs.; $1,700, at 6%, due in 5 yrs. Sinking Fund, none. MANAGEMENT.—Prest., S. A. Steadman; Ch. Pump. Engr., J. P. Wilson. Rept. by Secy. and Supt., C. H. Day, Aug. 28, '96. SEWERS.—Has sanitary sewers only.

F 7. **MANILLO,** Crawford Co. (526.) Small fire protection system, railway owning and operating pump, which lifts water to 24 × 30-ft. tank (100,000 galls.). Village has laid mains on ten blocks. Rept. by E. E. Nichol, Dec. 14, '96.

98. **MANNING,** Carroll Co. (1,233.) Built in '94 by village. SUPPLY.—Pumping to stand-pipe. FINANCIAL.—Cost, probably about $5,000. Bonds, $5,000. Address Jno. Hoffman.

F 8. **MONSON,** Calhoun Co. (822.) Built in '91-2 by city for fire protection. Supply, well, pumping to 56,000-gall. tank. Mains, 2,100 ft. Hydrants, 5. Pressure, 40 lbs. Cost, $5,000. No debt. Unsigned rept., Oct. '91. Oct. 23, '96, C. R. Nicholson was Mayor and Chn. W.-W. Com.

99. **MAPLETON,** Monona Co. (782.) Built in '93 by city; completed in Dec. Des. Engr., C. F. Loweth, St. Paul. Contr., J. W. Smith, Sioux City. SUPPLY.—Open well, pumping to tank. PUMP.—Cap., 500,000 galls.; dup. TANK.—Cap., 50,000 galls.; wooden; covered. DISTRIBUTION.—Mains, 1 mile. Hydrants, 8. FINANCIAL.—Cost, $8,500. MANAGEMENT.—Rept. by Engr., in '96. SEWERS.—None.

100. **MAQUOKETA,** Jackson Co. (3,077.) Built in '83-4 by city. SUPPLY.—Well, pumping to stand-pipe and direct. Well is 22 × 30 ft., 500 ft. from river. PUMP.—Cap., 1,750,000 galls.: 1,500,000 Blake dup. rept. in '89; makers rept. 1,250,000 Worthington comp. non-cond. STAND-PIPE.—Cap., about 60,000 galls.; w. l., 12½ × 80 ft., 175 ft. above, ¾ mile from pump. FISCAL YEAR CLOSED March 1. DISTRIBUTION.—Mains, 8 miles. Taps, 250. Hydrants, 8. PRESSURE.—Ordinary, 65 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $34,653. Bonded debt, $15,500, at 6%. Expenses, $2,576: Operating, $1,646; int., $930. Revenue: Consumers, $1,600; City, none. NOTE.—No rept. since '90-1 Manual. SEWERS.—None. REFERENCE.—Eng. News, May 9, '85.

101. **MARCUS,** Cherokee Co. (671.) Built in '95 by Marcus Water-Works Assoc.; put in operation Aug. 1. Engr., S. B. Howe, Sioux Falls, S. D. FRANCHISE.—20 yrs., from '95, and provides for the optional purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $350 per yr. for fire protection only. No legal difficulties. SUPPLY.—Well, pumping to tank. PUMP.—Driven by 18-ft. windmill. TANK.—Cap., 56,400 galls.; wood; 20 × 24 on brick tower 67 ft. high. FISCAL YEAR CLOSED Aug. 31. DISTRIBUTION.—Co. can compel use of meters and any consumer may have one. Hydrants, public, 12. FINANCIAL.—Cost, $7,012. Cap. Stock: authorized, $25,000; paid-up, $6,690; paid 3½% div'd in '95. Floating debt, $42. Expenses: Operating, $208, including taxes; int., $17. Revenue, $445. MANAGEMENT.—Prest., F. S. Barnes; Treas., J. P. Roe; Supt., J. P. Miller; Ch. Pump. Engr., F. Tschill. Rept. by Secy., Benj. Radcliffe, Sept. 3, '96. SEWERS.—None.

102. **MARENGO,** Iowa Co. (1,710.) Built in '95 by village. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. Fire protection works were built by the city in '75. SUPPLY.—15 driven wells, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; Worthington comp. non-cond. Electric Light Co. furnishes power and does the

pumping for $600 per yr. TANK.—Cap., 56,400 galls.; 20 x 24 ft., wood on steel trestle 100 ft. high, with 36 x 36-ft. base. DISTRIBUTION.—Mains, 3½ miles. Taps, 25; made by city. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 23. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Bonded debt, $11,000, due in 20 yrs. or at option of city after 5 yrs. Expenses, pumping, $600. Revenue: Consumers, $230. Rept. by A. J. Morrison, June 11, '96. SEWERS.—None. REFERENCE.—Eng. News, Apr. 22, '82.

103. **MARION,** Linn Co. (3,094.) Built in '84-5 by Jesse W. Starr, Philadelphia, as Marion City Water Co.; reorganized in '87. FRANCHISE.—25 yrs., from '87. SUPPLY.—Bowman and Davis springs, pumping from receiving reservoir to stand-pipe and direct; Indian Creek connected with pumps for reserve supply. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. RESERVOIR.—Cap., 600,000 galls. DISTRIBUTION.—Mains, 9 miles. Taps, 166. Meters, 3. Hydrants, 58. PRESSURE.—(In '88. Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $127,000. Revenue: City, $3,240. NOTE.—No rept. since '90-1 Manual.

—? **MARNE,** Cass Co. (Est., 439.) Rept. as having works.

104. **MARSHALLTOWN,** Marshall Co. (8,914.) Built in '76 by city. SUPPLY.—Filter galleries, near Iowa River, pumping direct. PUMPS.—Cap., 5,000,000 galls.; Laidlaw-Dunn-Gordon, 2,000,000 and 3,000,000. Bituminous slack coal used; av. cost, $1.39 per short ton. DISTRIBUTION.—Mains (in '91), 14 miles. Taps (in '91), 750. Hydrants, public, 170. CONSUMPTION.—(Galls.) av., 1,400,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $187,000. Bonded debt, $37,000, due in July, '96. Sinking Fund: $4,500. MANAGEMENT.—Rept. by Secy., J. G. Trotter, July 8, '96. PROJECTED IMPROVEMENTS.—Filter; but no steps taken. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Aug. 20, '81.

105. **MASON CITY,** Cerro Gordo Co. (4,007.) Built in '85 by town. SUPPLY.—Springs and Lime River, pumping direct; reported in '91 that contract had been let for artesian well. PUMPS.—Cap., 1,500,000 galls.; two Blake dup. Makers rept. 12 x 16-in. Rand compressor furnished in '94 for air lift. RESERVOIR.—Cap. (in '89), 150,000 galls. DISTRIBUTION.—Mains, 2.8 miles. Taps, 125. Meters, 4. Hydrants, 25. FINANCIAL.—(In '88.) Cost, $28,000. Bonded debt, $26,000, at 6%. Expenses, $4,217: Operating, $2,657; int., $1,560. Revenue, $4,925: Consumers, $3,407; City, $1,518. NOTE.—No rept. since '90-1 Manual. SEWERS.—None. REFERENCE.—Eng. News, Apr. 17, '86.

F 9. **MAXWELL,** Story Co. (453.) Built in '94 by village for fire protection. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia. Supply, well, 6 ins. x 98 ft., pumping to tank. Pump is driven by 18-ft. windmill. Tank, cap., 47,000 galls.; 20 x 20 ft., wood on wood tower 45 ft. high. Mains, 0.7 mile. Hydrants, public, 11. Pressure, 65 lbs. Cost, $4,000. Bonded debt, $4,000, at 6%. Expenses: Operating, $35. Rept. by Chas. Piper, July 30, '96. No sewers.

106. **MISSOURI VALLEY,** Harrison Co. (2,797.) Built in '89 by city. SUPPLY.—Ten driven wells, pumping to reservoir. PUMP.—Cap., 750,000 galls.; Smedley high-pressure. RESERVOIR.—Cap., 200,000 galls.; 220 ft. above pump. DISTRIBUTION.—Mains, 1.5 miles. Taps, 28. Meters, 2. Hydrants, 10. PRESSURE.—(In '88.) Ordinary, 100 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $15,000, at 5%. Expenses, $1,410: Operating, $660; int., $750. Revenue: Consumers, $335. NOTE.—No report since '90-1 Manual.

107. **MONTEZUMA,** Poweshiek Co. (1,062.) Built in '95 by town. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Deep well, pumping to tank. PUMP.—Wind engine. TANK.—Cap., 74,000 galls.; wood; 24 x 22 ft., on steel trestle 100 ft. high. DISTRIBUTION. — Taps, 4. CONSUMPTION. — Small. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $8,000. MANAGEMENT.—Rept. by Clk., W. C. McKee, Nov. 20, '96. SEWERS.—None. REFERENCES.—Gasoline pumps, Eng., News, May 28, '96, illus. and inset; gin pole used in erecting tower, Jan. 9, '96, illus.

—? **MONTOUR,** Tama Co. (409.) Rept. as having works.

108. **MONTICELLO,** Jones Co. (1,988.) Built in '78 by city. SUPPLY.—Artesian well, pumping to reservoir. Well is 1,200 ft. deep, extending into Potsdam sandstone. PUMPS.—Cap., 230,000 galls.; Blake; Smedley also reported in '89. RESERVOIRS.—Cap., est., 500,000 galls.; 80 x 20 ft.; 100 ft. above town. DISTRIBUTION.—(In '88.) Mains, 3 miles. Taps, 215. Hydrants, 24. PRESSURE.—(In '88.) Ordinary, 45 lbs. FINANCIAL.—(In '88.) Cost, $20,000. Bonded debt, $7,000, at 5½%. Expenses, $1,485: Operating, $1,200; int., $385. Revenue, $3,500: Consumers, $2,000; City, $1,500. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 25, '82.

109. **MOUNT PLEASANT,** Henry Co. (3,997.) Built in '84 by Mount Pleasant Water-Works Co. SUPPLY.—Big Creek, pumping to stand-pipe; filtered. PUMPS.—Cap., not given; two Blake, one dup. and one high pressure. FILTERS.—Cap., 500,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 39,000 galls.; 10 x 80 ft. DISTRIBUTION.—(In '88.) Mains, 6 miles. Taps, 65. Meters, 7. Hydrants, 50. PRESSURE.—(In '88.) Ordinary, 35 lbs.; fire, 80 lbs. FINANCIAL.—(In '88.) Cap. Stock, $130,000. No debt. NOTE.—No rept. since '90-1 Manual.

110. **MOVILLE,** Woodbury Co. (295.) Built in '95 by city; put in operation Jan. 1. Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Surface well, pumping to tank. PUMP.—Directing- acting pump, driven by 20-ft. windmill. TANK.—Cap., 36,000 galls.; soft pine; 16 × 24 ft., on wood tower 40 ft. high. DISTRIBUTION.—Mains, ½ mile. Hydrants, public, 6. MANAGEMENT.—Mayor, C. A. Beard. Rept. by Contrs., Dec., '96.

111. **MUSCATINE,** Muscatine Co. (11,454.) Built in '75-6 by Muscatine Water-Works Co. FRANCHISE.—25 yrs. from '76; provides for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for hydrant rental. No legal difficulties. SUPPLY.—Mississippi River, pumping to reservoir. PUMPS.—Cap., 4,500,000 galls.; two Laidlaw-Dunn 3,000,000 and 1,500,000. Wood used; av. cost, $2 per cord. RESERVOIR.—Cap., 2,000,000 galls.; distributing, covered, 200 ft. above city. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 10 miles; cost extensions met by bonds or earnings. Taps, 500; made by Co. at cost. Services, lead; paid for by consumer. Meters: 70; owned, controlled and repairs paid by Co.; yearly rental, 8% of cost. Co. can compel use of meters and any consumer may have one. Hydrants, public, 101. CONSUMPTION.—(Galls.) av., 500,000; max., 1,000,000; min., 300,000. PRESSURE.—Ordinary, 75 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $110,000. Cap. Stock: Authorized, $100,000; all paid-up. Debt, $6,000, at 5%, due at any time. Expenses, taxes, $2,000. MANAGEMENT.—Prest., Alex. Jackson; Secy., J. Caraksddan; Treas., F. Sawyer. Rept. by Supt., Wm. Molis, June 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Oct. 15, '81; covered reservoir, Dec. 3, '87.

112. **NASHUA,** Chickasaw Co. (1,240.) Built in '85 by city. SUPPLY.—Cedar River, pumping direct. PUMP.—Rotary water power. FISCAL YEAR CLOSED Feb. 20. DISTRIBUTION.—Mains, 2½ miles. Taps, 75; made by consumer. Services, ¾-in. galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 24. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. MANAGEMENT.—Secy., J. W. Bradford. Rept. by Ch. Pump. Engr., W. A. Lytle, June 8, '96. SEWERS.—None.

F 10. **NEOLA,** Pottawattamie Co. (917.) Built in '87 by village for fire protection. A 450,000-gall. Knowles pump lifts water from well to 60,000-gall. tank. Mains, 0.8 mile. Hydrants, 7. Pressure, 60 to 100 lbs. Cost, $5,500. Debt, $3,000, at 6%. From '88-9 Manual.

113. **NEVADA,** Story Co. (1,662.) Built in '88 by village. SUPPLY.—Deep well, pumping to tank. PUMPS.—Cap., 1,144,000 galls.: 644,000 Curtis, driven by windmill; 500,000 Deane dup. TANK.—Cap., 105,000 galls.; wood; 30 × 20 ft., on wooden trestle about 110 ft. above pumps. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxes. Taps, made by city. Meters: 32; owned by consumer. Use of meters compulsory for all consumers. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 18,900. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—(In '90.) Cost, $12,000. Bonded debt, $12,000, at 5½%. Expenses, $760: Operating, $100; int., $660. Rept. by Wm. Gates, June 10, '96. SEWERS.—None.

—? **NEWBURG,** Jasper Co. (Est., 39.) Rept. as having works.

114. **NEW HAMPTON,** Chickasaw Co. (1,314.) Built in '91 by town. SUPPLY.—Deep well, pumping to tank and direct. PUMPS.—Cap., 500,000 galls.; Smith-Valle, dup., steam supplied from neighboring mill. TANK.—Cap., 55,000 galls., on 80-ft. wooden tower. DISTRIBUTION.—Mains, ¾ mile. Services, w. i. Hydrants, public, 11. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $6,827. Bonded debt, $7,000. NOTE.—No rept. since '90-1 Manual.

F 11. **NEW HARTFORD,** Butler Co. (Est., 452.) Built in '96 by town for fire protection. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. Supply, well, pumping to tank. Cost, $3,000.

115. **NEWTON,** Jasper Co. (2,564.) Built in '84 by town, chiefly for fire protection. SUPPLY.—Artesian well, pumping to reservoir (and tank?). PUMPS.—Smith-Valle. RESERVOIR.—Cap., about 100,000 galls. TANK.—Press rept. Aug., '95, stated 80,000-gall. metal tank had just been completed. DISTRIBUTION.—Mains, 1.9 miles. Taps, 25. Hydrants, public, 21. FINANCIAL.—Cost, $20,000. Revenue, $3,900. MANAGEMENT.—Rept. by Supt., A. C. Gates, Sept. 23, '96.

44. **NORTH DES MOINES** (P. O. Des Moines), Polk Co. See Des Moines.

F 9. **NORTHWOOD,** Worth Co. (859.) Press rept., Mar., '97, stated town would vote on building works to cost $8,000.

116. **OAKLAND,** Pottawattamie Co. (686.) Built in '94 by town; put in operation Nov. 1. Engr., F. L. Burrell, Fremont, Neb. Contr., J. B. Rahm, Omaha, Neb. SUPPLY.—Driven wells, 18 to 20 ft. deep, near river, pumping to stand-pipe. PUMP.—Gardner, (Peoria, Ill.) STAND-PIPE.—Cap., 42,000 galls.; steel 12 × 50 ft. DISTRIBUTION.—Mains, 1.3 miles. Taps, 70; made by consumer at cost of $10 for ¾-in. and $12 for 1-in. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 14; private, 1. CONSUMPTION.—(Galls.) av., 60,000. FINANCIAL.—Cost, $7,000. Debt, $8,300: Floating, $1,300; bonded, $7,000 at 6%. Expenses: Operating, $600. Revenue: Consumers, unmetered, $600. MANAGEMENT.—Secy., H. E. West; Supt., S. D. Fobey;

Ch. Pump Engr., C. Burrow. Rept. by I. N. Gardner, July 28, '96. SEWERS.—Partial system of storm sewers only.

117. **ODEBOLT,** Sac Co. (1,122.) Bought by city in '94; built in '84 by Odebolt Water-Works Co. SUPPLY.—Artesian well and springs, pumping to tank. PUMPS.—Cap., 250,000 galls.; 250,000 Knowles, and 100,000 Cook deep well. TANK.—Cap., 45,000 galls.; wood, 18 × 24 ft., on trestle 40 ft. high. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by water fund. Taps, 60; made by consumer. Services, galv. i.; paid for by consumer. Meters: 1; owned, controlled and repairs paid by property owner. Use of meters optional with consumer; compulsory for large consumers. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 25,000; max., 85,000; min., 15,000. PRESSURE.—Ordinary or fire, 50 lbs. FINANCIAL.—Cost, $12,000. Revenue: Consumers, $1,000; street sprinkling, $50. Fire protection is paid by a 5-mill tax. MANAGEMENT.—Chn., H. Hanson. Rept. by Jos. Matles, July 11, '96. SEWERS.—None. REFERENCE.—Eng. News, May 30, '85.

118. **OELWEIN,** Fayette Co. (830.) Built in '96 by city; put in operation Apr. 1. Engr., W. S. Huntington (Iowa Engineering Co., Clinton, rept. that they were Engrs.) Contrs., Dubuque Construction Co., Dubuque. SUPPLY.—Five driven wells, pumping to stand-pipe. PUMP.—Cap., 750,000 galls.; Buffalo. STAND-PIPE.—Cap., 92,000 galls.; steel, 14 × 80 ft. DISTRIBUTION.—Mains, 1½ miles. Taps, 30. Meters, 0. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 35,000. PRESSURE.—Ordinary, 70 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $15,500. Bonded debt, $13,720, at 6%; due in 1915. Expenses: Operating, $950. Revenue, Consumers, $500. MANAGEMENT.—Supt., B. F. Little; Ch. Pump. Engr., M. M. Wood. Rept. by Supt. and Des. Engr., Feb. 2, '97. SEWERS.—None.

F 12. **ONAWA,** Monona Co. (1,358.) Built by town for fire protection only. Twenty driven wells, pumping with Gardiner double-acting pump, by power supplied by electric light plant. Mains, 250 ft. of 6-in. pipe. Hydrants, 1. Cost, $650. Mayor, L. D. Bearce; Recorder, Geo. Underhill. Rept. by Recr., July 27, '96.

F 13. **ORANGE CITY,** Sioux Co. (1,246.) Built in '96 by city; put in operation Sept. 1. Engr., F. E. Wade, Sheldon. Contrs., Fairbanks, Morse & Co., Chicago. Supply, drilled well, about 300 ft. deep, pumping to tank. Pump, cap., 48,000 galls.; 8¾-in. artesian well cylinder, driven by 6-HP. gasoline engine. Tank, cap., 63,000 galls.; cypress, 20 × 24 ft., on steel tower 87 ft. high. Mains, 1,900 ft. No taps for domestic service as yet. Hydrants, public, 5. Cost, $9,000. Mayor, A. Bolks. Rept. by Contrs., Dec., '96.

F 10. **OSCEOLA,** Clarke Co. (2,120.) People were to vote in Mar., '97, on building works. Supply, wells, pumping to stand-pipe. Mains, 3 miles. Rept. by Ch. Fire Dept., Jno. Kemp, Feb., '97.

119. **OSKALOOSA,** Mahaska Co. (6,558.) Built in '80 by Oskaloosa Water Co. FRANCHISE.—20 yrs. from '80. SUPPLY.—Surface water, pumping to stand-pipe and direct; filtered. Sept., '91, 20-ft. well was being sunk on steel shoe in bottom of Skunk River. PUMPS.—Cap., 3,000,000 galls.; 1,500,000 and 1,000,000 Holly quadruplex; 500,000 Deane. FILTERS.—Cap., 500,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 280,000 galls.; steel; 20 × 120 ft. DISTRIBUTION.—(In '88.) Mains, 14 miles. Taps, 452. Meters, 16. Hydrants, 60. PRESSURE.—Ordinary, 45 lbs.; fire, 90 lbs. FINANCIAL.—Withheld. NOTE.—No rept. since '89-90 Manual. REFERENCE.—Submerged pipe, Eng. News, Jan. 23, '92, illus.

120. **OTTUMWA,** Wapello Co. (14,001.) Built in '77-8 by Iowa Water Co. Press repts. state that Co. was in hands of receiver in latter part of '96, and that on Feb. 20, '97, U. S. Court ordered works sold under judgment in favor of Farmer's Loan & Trust Co. FRANCHISE.—25 yrs. from '77; does not provide for purchase of works by city. Rates are not fixed in franchise. SUPPLY.—Des Moines River, pumping to reservoir and direct. PUMPS.—Cap., 4,500,000 galls.: 2,000,000 and 500,000 Flanders; 2,000,000 Deane. Av. cost of coal used, per short ton: Slack, 75 cts.; nut, $1.25; lump, $1.75, and run of mine, $1.30. FILTERS.—Cap., 2,000,000 galls.; Jewell gravity. RESERVOIRS.—(In '89.) Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 25 miles. Taps, 1,000. Services, lead and iron; paid for by consumer. Meters: 57; owned, controlled and repairs paid by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 146; private, 6. CONSUMPTION.—(Galls.) av., 1,200,000; max., 1,500,000. PRESSURE.—Ordinary, 85 lbs.; fire, 140 lbs. FINANCIAL.—(In '90.) Cost, $600,000. Expenses: Operating, $8,500. Revenue: City, $10,000. MANAGEMENT. — Receiver, Wm. A. Brownell; Ch. Pump. Engr., F. E. Flanders. Rept. by Supt., Abram Wing, June 22, '96. SEWERS.—Has partial system of sanitary sewers. REFERENCE.—Eng. News, Apr. 1, '82; Jewell filters, May 28, '96, illus.

121. **OXFORD,** Johnson Co. (515.) Built in '95 by town; put in operation in Jan., '96. Engrs., Iowa Engineering & Construction Co., Clinton. Contrs., Fairbanks, Morse & Co. SUPPLY.—Well, pumping to tank. PUMP.—Driven by gasoline engine. TANK.—Cap., 47,000 galls.; wood; 20 × 20 ft., on 35-ft. tower. DISTRIBUTION.—Mains, ¾ mile. Taps, 15; made by city for $1. Services, galv. i.; paid for by consumer. Hydrants, public, 12. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $4,800, at 6%; due in 1905. MANAGEMENT.—Rept. by Recr., Geo. W. Sies, June 11, '96. SEWERS.—None.

122. **PANORA,** Guthrie Co. (809.) Built in '92 by city; completed in Dec. Des. Engr., C. F. Loweth, St. Paul. Contr., Smedley Mfg. Co., Dubuque. SUPPLY.—Driven wells and large open well, pumping to tank. PUMP.—Cap., 750,000 galls.; Smedley dup. TANK.—Cap., 50,000 galls.; on 80-ft. wooden tower. DISTRIBUTION.—Mains, ¾ mile. Hydrants, 7. PRESSURE.—Ordinary, 45 lbs.; fire, direct. FINANCIAL.—Cost, $9,000. MANAGEMENT.—Rept. by Engr., for works as they stood at completion. SEWERS.—None.

123. **PARKERSBURG,** Butler Co. (760.) Built in '94 by city. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Six 126-ft. wells, pumping to tank. PUMP.—Cap., 75,000 galls.; vertical. Press rept. in '96 stated windmill had been erected, to be used when possible as a matter of economy. TANK.—Cap., about, 60,000 galls.; wood, 24 (at bottom) × 20 ft.; covered; on 58-ft. steel tower. DISTRIBUTION.—Mains, 2 miles. Hydrants, 10 or more. FINANCIAL.—Cost, $8,000. MANAGEMENT.—Rept. by Contrs., early in '95. REFERENCE.—Tank, Eng. News, Jan. 17, '95, illus.

—? **PAULLINA,** O'Brien Co. (510.) Under construction '96-7 by town. Engr., L. F. Wakefield, Sioux City. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—14 2-in. driven wells in bottom of creek, pumping to tank. PUMP.—Cap., 480,000 galls. Illinois bituminous coal used; av. cost, $5 per short ton. TANK.—Cap., 60,000 galls.; 24 × 18 ft., on 12-post steel tower 70 ft. high. DISTRIBUTION.—Mains, 1 mile. Taps, 2. Meters, 0. Use of meters optional with city; will be compulsory for large consumers. Hydrants, public, 7. FINANCIAL.—Cost, $9,000. Debt, $4,290: Outstanding warrants, $1,600; Bonded debt, $2,690, at 6%, due 1904. Deficits are entirely met by taxation. MANAGEMENT.—Mayor, L. N. B. La Rue. Rept. by Recorder, Stephen Harris, June 12, '96, who also stated, Feb. 6, '97, that works were not yet completed. SEWERS.—None.

P 11. **PELLA,** Marion Co. (2,408.) Cy. Clk., rept., May, '95, that boring of well was to be started at once and that $19,000 of bonds for works had been voted; also in Aug., '96, that the well was still being drilled, and probably works would not be built before spring. Water will be pumped to stand-pipe. Est. cost, $20,000. Engr., E. J. Spencer, Security Building, St. Louis. W.-W. Com.: D. S. Huber and J. D. Gaass.

124. **PERRY,** Dallas Co. (2,880.) Built in '91 by city; supply previously introduced by city for fire protection. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; 750,000 high pressure and 1,000,000 comp. dup. Bituminous coal used; av. cost, $1.25 per short ton. STAND-PIPE.—Cap., 60,000 galls.; steel, 10 × 100 ft. DISTRIBUTION.—Mains: cost extensions met by rentals. Taps made by city plumber for consumer. Services, galv. i.; paid for by consumer. Meters: 12 or 15; owned by consumer; controlled and repaired by city. Use of meters optional with consumer; compulsory for hotels, livery stables and a few private consumers. Hydrants, public, 40; private, 5. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $26,020. Debt, $18,000: Floating, $5,000, at 7%; bonded, $13,000, at 6%. Expenses: Operating, $1,450. Revenue: Consumers, $4,200. MANAGEMENT.—Ch. Pump. Engr., Jas. Houser. Rept. by Allen Breed, Aug. 27, '96. SEWERS.—None.

125. **PETERSON,** Clay Co. (371.) Built in '95 by town. Contrs., Iowa Construction & Mfg. Co., Clinton. SUPPLY.—Well, pumping to reservoir. PUMP.—Cap., 12,000 galls.; driven by windmill. RESERVOIR.—Cap., 50,000 galls.; 150 ft. above city. DISTRIBUTION.—Mains, ⅛ mile. Taps, 15. Meters: 15; owned and controlled by city. Use of meters compulsory for all consumers. Hydrants, public, 5. FINANCIAL.—Cost, $25,000 (?). Bonded debt (?), $25,000. MANAGEMENT.—Rept. by R. B. Tillinghast, June, '96. SEWERS.—None.

126. **PORTSMOUTH,** Shelby Co. (250.) Built in '95 by city; put in operation Sept. 1. No Contr. SUPPLY.—Well, pumping to tank. PUMP.—Driven by 3-HP. gasoline engine. TANK.—Cap., 63,000 galls.; wood, 20 × 20 ft., on 24-ft. tower. DISTRIBUTION.—Mains, 3,600 ft. Taps, made by city for $2.50. Services, ¾-in.; paid for by owner of property. Meters, 0; yearly rental, $4.00. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 3,000. FINANCIAL.—Cost, $4,000. Debt, $2,800: Floating, $300; Bonded, $2,500, at 6%; due 1905, at option after 5 yrs. Expect saloon license to pay water-works bonds before they are due. MANAGEMENT.—Rept. by R. F. Scroggin, Town Treas., Aug. 26. SEWERS.—None.

127. **POSTVILLE,** Allamakee Co. (884.) Built in '94 by town. Engrs. and Contrs., Smedley Mfg. Co., Dubuque. SUPPLY.—Well, pumping to tank. PUMP.—Smedley vert. TANK.—Cap., 70,000 galls.; steel, 20 × 80 ft., on 8 steel posts; Contrs., Crellin & Lovell, Des Moines, Ia. DISTRIBUTION.—Mains; cost extensions met by town warrants. Taps, 18; made by consumer. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 12; private, 8. FINANCIAL.—Cost, $8,500. Bonded debt, $8,000, at 5%; due in ten yrs. MANAGEMENT.—Rept. by Wm. Shepherd, June 13. SEWERS.—None.

128. **PRAIRIE CITY,** Jasper Co. (684.) Built in '94 by city; put in operation Dec. 1. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Deep well, pumping to tank. PUMP.—Driven by windmill. TANK.—Cap., 47,000 galls.; steel; 20 × 20 ft., on 80-ft. steel tower. DISTRIBUTION.—Taps, 40; made by consumer. Services, w. i.; paid for by consumer. Meters, 3; owned by consumer. Use of

meters optional with city; compulsory for factories. Hydrants, public, 35; private, 1. FINANCIAL.—Cost, $9,000. Bonded debt, $9,000, at 5%; due 1909. Rept. by Recorder, Geo. K. Scott, June 12. SEWERS.—None.

129. **RED OAK,** Montgomery Co. (3,821.) Built in '80-1 by village. SUPPLY.—Eight 2-in. and ten 8-in .driven wells for domestic supply, and two open wells for fire protection, pumping direct. PUMPS.—Cap., 2,400,000 galls.: 800,000 (two) Smith & Vaile, rept. in '89; two Deane rept. by makers as added since, a 750,000 dup. in '90 and an 850,000 comp. dup. in '94. STAND-PIPE.—Contract was let for 20 × 100-ft. stand-pipe in '94. Press rept. in '95 stated foundation was in and that new plates were being made, old having been rejected. DISTRIBUTION.—Mains, 7 miles. Hydrants, 47. PRESSURE.—(In '88.) Ordinary, 80 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $21,000, at 5%. Expenses, $4,450: Operating, $3,400; int., $1,050. NOTE.—No official rept. since '90-1 Manual. SEWERS.—None in '90. REFERENCE.—Eng. News, July 11, '85.

130. **REINBECK,** Grundy Co. (731.) Built in '94 by city; put in operation Jan. 1, '95. Fire protection plant built in '83. Engrs. and Contrs., Fairbanks, Morse & Co., Chicago. SUPPLY.—Drilled well, about 375 ft. deep, pumping to tank. PUMP.—Deep-well steam, with 5¾-in. water cylinder. TANK.—Cap., 63,000 galls.; soft pine; 20 × 24 ft., on wood tower 40 ft. high. DISTRIBUTION.—Mains, 6,000 ft. Taps, 70. Hydrants, public, 10. FINANCIAL.—Cost, $8,000. Operating expenses, $600. Revenue, $585. MANAGEMENT.—W.-W. Com., Herman Miller and A. Tschirgi. Rept. by Contrs., Dec., '96.

F 14. **REMSEN,** Plymouth Co. (580.) Built in '95 by town for fire protection. Contrs., Sioux Falls Co., Sioux Falls, S. Dak. Supply, wells, pumping to reservoir and tank. Cost, $6,000. Address Council. Rept. by Jno. P. Kieffer, July 28, '96.

131. **ROCKFORD,** Floyd Co. (1,010.) Built in '91 by city; put in operation Nov. 1. SUPPLY.—Shell Rock River, pumping direct. PUMPS.—Cap., 130,000 galls.; Blake. Bituminous nut coal used; av. cost, $3 per short ton. FILTER.—Gravel. TANK.—Cap., 52,000 galls.; elevated. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by corporation tax. Taps, 42; made by city; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 19; private, 0. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 40 lbs.; fire, 150 lbs. Steam fire engines are used. FINANCIAL.—Cost, $7,000. MANAGEMENT.—Treas., B. E. Walles. Rept. by Supt., I. Clausen, June 15. SEWERS.—None.

132. **ROCK RAPIDS,** Lyon Co. (1,894.) Built in '89-91 by Rock Rapids Water Co.; now owned by J. W. Hopkins, Peru, Ill. FRANCHISE.—20 yrs. from '90; provides for purchase of works by city in 1900 or optional every 5 yrs. thereafter. Rates are fixed in franchise. Co. is not exempt from local taxes. Water is free for public schools and churches. SUPPLY.—(In '89.) Fifty driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Knowles; one 1,000,000 comp. dup. and one 500,000 high pressure dup. Lump coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 36,250 galls.; 100 ft. high, 70 ft. above city. DISTRIBUTION.—Mains, 3¼ miles. Taps, 200; made by consumer for $3.50. Services, galv. i.; paid for by consumer. Meters, 1: owned and repairs paid by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 25. PRESSURE.—Ordinary, 50 to 73 lbs.; fire, 75 to 100 lbs. FINANCIAL.—Cap. Stock (in '90), $50,000. MANAGEMENT.—Ch. Pump. Engr., T. Payton. Rept. by Supt., D. R. Whitaker, Aug. 17, '96. SEWERS.—Has partial system of storm sewers.

133. **ROCKWELL CITY,** Calhoun Co. (516.) Built in '96 by city; put in operation Mar. 1. Engr., Fremont Turner, Des Moines. SUPPLY.—3-in. well, pumping to stand-pipe. PUMP.—Cap., 18,000 galls.; Cook deep-well pump, operated in connection with electric light plant. Nut coal used; av. cost, $1.50 per short ton. STAND-PIPE.—Cap., 83,000 galls.; 12 × 100 ft. DISTRIBUTION.—Taps made and services paid for by consumer. Hydrants, public, 13. PRESSURE.—Ordinary, 44 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $7,000, at 5%, due in 20 yrs. MANAGEMENT.—Prest., T. C. Gregg, Mayor; Secy., Geo. Spencer.

134. **ROLFE,** Pochaontas Co. (529.) Built in '95 by town; put in operation in Apr. Contrs., Crellin & Lovell, Des Moines, Ia. SUPPLY.—Well, 8 ins. × 100 ft., pumping to reservoir and tank. PUMP.—Deep-well, operated by gasoline engine; also a Van Wie triplex, operated by gasoline engine, used for fire protection. RESERVOIR.—Cap., 50,000 galls.; storage, near pump house. TANK.—Cap., 26,000 galls.; wood, on four-post steel tower, 65 ft. high. DISTRIBUTION.—Mains, 4,500 ft.; cost extensions met by city revenue. Services, iron; paid for by owner. Meters, 0. Hydrants, public, 13. PRESSURE.—Ordinary, 30 lbs.; fire, 100 lbs. FINANCIAL.—Cost (contract price), $6,500. Rept. by Crellin & Lovell, Dec. 18, '96. SEWERS.—None.

135. **SABULA,** Jackson Co. (918.) Built in '95 by city; put in operation in Sept. Consult. Engr., S. M. Highland, Clinton. SUPPLY.—Artesian well, by natural pressure. Well is 978 ft. deep and has dy. cap. of 1,150,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by direct tax levy. Taps, 81; made by bonded plumber for consumer at $10 for ¾-in. and $11 for 1-in. tap. Services, galv. i.; paid for by property owner. Meters, 0. City can compel use of me-

ters and any consumer may have one. Hydrants, public, 27; private, 150. PRESSURE.—Ordinary, 35 lbs. FINANCIAL.—Cost, $10,000. Debt, $9,500: Floating, about $1,000; Bonded, $8,500, at 5%, due in 1904. Operating expenses, nominal; int., $425. Revenue: Consumers, $267. No deficits. MANAGEMENT.—Treas., J. Hilsinger. Rept. by Mayor, Chn. W.-W. Com. and Supt., S. E. Day, June 11, '96. SEWERS.—Has storm sewers only.

136. **SAC CITY,** Sac Co. (1,249.) Built in '84 by city for general supply. SUPPLY.—Wells and springs, pumping by windmill and steam pump. MANAGEMENT.—Comr., S. L. Watt. Rept. by Mayor, W. H. Hart, Sept. 21.

137. **SANBORN,** O'Brien Co. (1,075.) Under construction in '96-7 by city; to be in operation Mar. 1. Contrs., Fairbanks, Morse & Co. Water will be furnished for fire protection and to limited extent for domestic use. SUPPLY.—Wells, pumping to tank. TANK.—Cap., 60,000 galls.; on 90-ft. steel tower. FINANCIAL.—Cost, $3,900; met by bonds. MANAGEMENT.—Address J. W. Francis. Rept. by Clk., J. H. Wolf, Dec. 12, '96.

—? **SCHALLER,** Sac Co. (333.) Built in '95 by city. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. Proposals were invited for 16 × 22-ft. (or 22 × 16 ?) pine tank on 50-ft. timber tower; ¾ mile pipe and 10 hydrants. Supply probably from well.

P 12. **SCRANTON,** Greene Co. (715.) Well yielding 144,000 galls. per day has been sunk and pump bought. Works will be built as soon as $4,500 in bonds are sold. Engr., Fremont Turner, Des Moines. Tank, 48,000 galls., on 74-ft. steel tower. Chn. W.-W. Com., J. J. Allen. Latest rept., Feb. 2, '97.

138. **SHELDON,** O'Brien Co. (1,478.) Built in '94 by city; put in operation Sept. 25. Contrs., Wheeler & Co., Beloit, Wis. SUPPLY.—Tile collecting pipes in bed of Floyd River, pumping to tank. PUMP.—Cap., 500,000 galls.; Smith-Valle dup. Fort Dodge coal u ed, av. cost, $2 per short ton. FILTERS.—Cap., 1,000,000 galls.; gravel, enclosed in wooden box. COLLECTING WELL.—Cap., 43,000 galls. TANK.—Cap., 63,000 galls.; on 24 × 75-ft. brick tower. DISTRIBUTION.—Mains, 2½ miles. Taps made by city, free. Services, galv. i.; paid for by consumer. Meters: 23; owned by city and consumers; controlled and repairs paid by city; yearly rental, $2.40. Use of meters compulsory for large consumers, mills and R. R. City can compel use of meters and any consumer may have one. Hydrants, public, 23; private, 2. CONSUMPTION.—(Galls.) av., 120,000. PRESSURE.—Ordinary, 55 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $15,000, at 5%, due in 10 or 20 yrs. from '94. Expenses, $1,950: Operating, $1,200; int., $750. Revenue: Consumers, unmetered, $840; metered, $960; public buildings, $56. Deficits are met by general taxation. MANAGEMENT.—Treas., F. E. Frisbee. Rept. by Supt. and Ch. Pump. Engr., J. O. Gates, in July. PROJECTED IMPROVEMENTS.—New pump to be built in '97. SEWERS.—None.

139. **SHENANDOAH,** Page Co. (2,440.) Built in '93 by city; put in operation July 16. Engr., S. L. Wiley, Omaha, Neb. Contrs., Dunnigan and Charles Worth. SUPPLY.—Driven wells, pumping to stand-pipe and direct. Press rept., Feb., '96, stated there were 28 2½-in. and one 10-in. driven well, all 40 ft. deep. PUMPS.—Cap., 2,500,000 galls.: 2—1,250,000 Deane comp. dup. Bituminous lump coal used; av. cost, $2.25 per short ton. STAND-PIPE.—Cap., 140,000 galls.; iron; 20 × 60 ft., on stone foundation. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by taxation. Taps, 200; made by consumer, no fee. Services, galv. i.; paid for by consumer. Meters, 31; owned and repairs paid by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 120,000; max., 300,000. PRESSURE.—Ordinary, 80 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $20,000, at 5%; due $10,000 each in 1902 and 1912. Expenses: Operating, $2,095; int., $1,000. Revenue: Consumers, $2,106; water tax, $3,365. MANAGEMENT.—Mayor, C. M. Conway; Ch. Pump. Engr., M. K. Bryte. Rept. by Cy. Clk., W. Comr. and Supt., L. N. Wilson, July 27, '96. SEWERS.—None.

P 13. **SIDNEY,** Fremont Co. (839.) Town has voted $10,000 bonds, and secured plans and specifications for works. Rept. by W. W. Morgan, Jan. 11, 97. There is now a small plant, with w. i. mains.

140. **SIGOURNEY,** Keokuk Co. (1,523.) Built in '95-6 by city; put in operation in Feb. Engr., Geo. W. Wynn, Cedar Rapids. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Well, pumping to tank. PUMPS.—Cap., 500,000 galls.; Worthington comp. non-cond. Bituminous coal used; av. cost, $2 per short ton. TANK.—Cap., 50,000 galls.; on steel tower 83 ft. high. DISTRIBUTION.—Mains, 4 miles. Taps, 15; made by consumer for $2.25. Meters: 4; owned by town and consumer; controlled by town; yearly rental, $6 and upward. Use of meters optional with city; compulsory for manufactories. Hydrants, public, 21. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $22,000. Debt, $20,900: Floating, $2,900, at 6%. Bonded, $18,000, at 5%; due in 9 yrs. MANAGEMENT.—Recorder, H. G. White; Supt., Geo. Covey. Rept. by Mayor, J. P. Falley, Aug. 22, '96. SEWERS.—None.

141. **SIOUX CITY,** Woodbury Co. (37,806.) Owned by city; built in '84-5 by City Water-Works Co. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—Cap., 6,000,000 (?) galls.; 2—3,000,000 Holly-Gaskill hor. high duty. Av. cost of coal used, $2.25 per short ton. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 45 miles; cost extensions met by contingent fund, partly. Taps, 3,500; made by city. Services, lead in street; paid for by consumer.

Meters, 300; owned, controlled and repairs paid by city. City can compel use of meters and any consumer may have one. Hydrants, public, 250; private, 2. CONSUMPTION.—(Galls.) av., 1,350,000. PRESSURE.—Ordinary, 110 lbs; fire, 140 lbs. FINANCIAL.—Cost, about $480,000. Bonded debt, $120,000. Operating expenses, $21,000. No tax levies for water-works made in last three years. MANAGEMENT.—Secy., T. A. Strong. Rept. by Supt., Phil. Carlin, June 6, '96.

142. **SIOUX RAPIDS,** Buena Vista Co. (650.) Built in '90 by town. SUPPLY.—Well, pumping to tank. TANK.—Cap., 50,000 galls. FISCAL YEAR CLOSED Feb. 5. DISTRIBUTION.—Mains, 2¼ miles. Taps, 120. Hydrants, public, 14. FINANCIAL.—Cost, $12,000. Debt, $7,000: Floating, $1,000, at 6%. Bonded, $6,000, at 6%. Revenue, $1,000. MANAGEMENT.—Secy., J. J. Jacobson. Rept. by Jno. M. Hoskins.

143. **SPENCER,** Clay Co. (1,813.) Built in '93 by city; put in operation July 3. Engr., Frank Kellogg. SUPPLY.—Driven wells, pumping to tank. PUMP.—Cap., 1,000,000 galls.; Smedley comp. dup. Steam furnished by Spencer Electric Co. under 6-yr. contract. Slack used; av. cost, $2 per short ton. TANK.—Cap., 30,000 galls.; wood; 18 × 16 ft., on wood trestle 12 ft. high. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, ¾ mile. Taps, 65; made by consumer, no fee. Services, galv. i.; paid for by consumer. Meters, 1; owned and repairs paid by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 27,000. PRESSURE.—Ordinary, 25 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $15,000. Debt, $8,600: Floating, $1,600. Bonded, $7,000, at 6%. Revenue, $970: Consumers, $550; City, fire protection, $400; sewer flushing, $20. MANAGEMENT.—Rept. by Ch. Pump. Engr., Frank Kellogg, Oct. 28, '96. SEWERS.—Has sanitary and storm sewers.

F 15. **SPIRIT LAKE,** Dickinson Co. (782.) Built in '94 by city for fire protection. Engrs. and Contrs., Smedley Mfg. Co., Dubuque. Supply, well, 106 ft. deep, lifted by deep-well pump to 68,000-gall. reservoir (also underwriters fire pump?) Mains, "4½ blocks." Hydrants, 5. Pressure, 80 to 115 lbs. Cost, $4,000. Bonded debt, $3,000, at 6%. Ch. Pump. Engr., Frank Hopkins. No sewers.

144. **SPRINGVILLE,** Linn Co. (518.) Built in '94 by Water-Works Co.; put in operation in Jan. Engr., J. H. Lary, Marion. Contr., Jno. Murray, Cedar Rapids. FRANCHISE.—20 yrs. from '95. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $35 per hydrant per annum. No legal difficulties. SUPPLY.—Well, pumping to tank. PUMP.—A 7 × 5 × 10-in. Fairbanks, Morse & Co. dup. TANK.—Cap., 50,000 galls.; wood, on wooden tower 42 ft. high. FISCAL YEAR CLOSED May 20. DISTRIBUTION.—Mains, 1 mile. Taps, 45; made by Co. Services paid for by consumer. Meters, 0. Use of meters optional with Co. Hydrants, public, 8. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $4,800. Cap. Stock: Common, authorized, $6,000; paid-up, $4,200. No bonds. MANAGEMENT.—Prest., C. F. Butler; Secy., E. D. Butterfield; Treas., L. B. Christman; Supt., A. J. Hoffman. Rept. by Secy., June 11. SEWERS.—None.

145. **STATE CENTRE,** Marshall Co. (854.) Built in '77 by city. SUPPLY.—Two wells, 58 ft. deep, pumping to tank. PUMP.—Cap., 70,000 galls.; windmill. TANK.—Cap., 80,000 galls.; 24 × 24 ft., on 30-ft. timber trestle. DISTRIBUTION.—Mains, ½ mile. Taps, 3. Hydrants, 11. PRESSURE.— Ordinary (in '88), 20 lbs. FINANCIAL.—Cost, $10,000. Debt, $5,000, at 6%. Expenses, $486: Operating, $186; int., $300. Revenue, $25. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 4, '82.

146. **STORM LAKE,** Buena Vista Co. (1,682.) Built in '91 by city; put in operation Aug. 15. SUPPLY.—Storm Lake, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Smith & Vaile comp. dup. FILTER BED.—Area, 250 ft.; 15 ft. in diam.; covered; upward filtration through 1 ft. each of stone, charcoal, coarse sand, small gravel and coarse gravel. STAND-PIPE.—Cap., 58,000 galls.; 10 × 100 ft. DISTRIBUTION.—Mains, 2.2 miles. Hydrants, 23. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $15,484. Bonded debt, $15,000, at 6%. NOTE.—No rept. since '90-1 Manual.

147. **STORY CITY,** Story Co. (536.) Built in '96 by Co.; put in operation Nov. 1. Engrs., Crellin & Lovell, Des Moines. Contrs., Western Engineering Co., Ottumwa. FRANCHISE.—20 yrs. from '96. Rates are subject to regulation by city ordinance. Co. is exempt from local taxes. SUPPLY.—Flowing well, pumping to tank. PUMP.—Cap., 350,000 galls.; Laidlaw-Dunn-Gordon. Bituminous coal used; av. cost, $2.50 per short ton. TANK.—Cap., 51,000 galls.; wood; 20 × 22 ft., on 75-ft. steel tower. DISTRIBUTION.—Mains, ½ mile; cost extensions met by taxation. Taps, 15; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 5. PRESSURE.—Ordinary, 40 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $6,000. Bonded debt, $5,000; due yearly. MANAGEMENT.—Mayor, T. L. Sherven; Recorder, W. A. Kelly. Rept. by Contrs., Nov. 16, '96. SEWERS.—Has storm sewers only.

F 16. **STRAWBERRY POINT,** Clayton Co. (947.) Built in '95 by city. Supply, drilled well, lifted to tank by deep-well pump, driven by 6-HP. gasoline engine. Tank, cap., 40,000 galls.; pine; on 65-ft. wood trestle. Mains, ½ mile. Hydrants, 6. Mayor, G. H. Scofield. Rept. by W. H. Garrett, Mgr., W.-Wks. Dept., Fairbanks, Morse & Co., Dec., '96.

—? **STUART,** Guthrie Co. (2,052.) Rept. as having works.

—? **SUMNER,** Brewer Co. (861.) Nov., '94, Frank Westcott, Recorder, rept. that bids would probably be received Nov. 15. Early in '97 Crellin & Lovell, Des Moines, rept. works in existence.

148. **TAMA,** Tama Co. (1,741.) Built in '92 by city. PUMP.—Cap., 570,000 galls.; Deane dup. (rept. by makers). FINANCIAL.—Press rept., May, '92, stated $15,000 of 5½%, 20 yr. bonds for works had been sold. NOTE.—Subject to revision.

149. **TIPTON,** Cedar Co. (1,599.) Built in '89 by city. SUPPLY.—Deep well, pumping from receiving reservoir to stand-pipe. PUMP.—Deane. Makers rept. 12 × 16-in. Rand compressor shipped July, '96, for air-lift. Av. cost of coal, $1.25 per short ton. RESERVOIR.—Cap., 27,000 galls. TANK.—Cap., 20,000 galls.; iron, 50 ft. high on brick tower 60 ft. high. DISTRIBUTION.—Mains, 3¼ miles; cost extensions met by water tax. Taps made by consumer, no fee. Services, galv. i.; paid for by consumer. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 40,000; max., 60,000; min., 20,000. FINANCIAL.—Bonded debt, $18,400, at 5%. Expenses, Operating, $1,500. Revenue, Consumers, $1,600. MANAGEMENT.—Ch. Pump. Engr., S. M. Murray. Rept. by Supt., Wm. Dean, June 5, '96. SEWERS.—None.

150. **TOLEDO,** Tama Co. (1,836.) Built in '91 by city; put in operation Sept. 15. SUPPLY.—Well, pumping from reservoir to tank. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane dup. non-cond. Steam coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 200,000 galls.; storage, at pumping station. TANK.—Cap., 27,000 galls.; steel, on brick tower. DISTRIBUTION.—Mains, 4 miles. Taps, 109; made by city for $3. Services, galv. i.; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 31. CONSUMPTION.—(Galls.) av., 15,000; max., 20,000; min., 10,000. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $20,000. Operating expenses, $800. Revenue, Consumers, $700. MANAGEMENT. Rept. by Ch. Pump. Engr., A. E. Bufkin, June 12, '96. SEWERS.—None.

151. **TRAER,** Tama Co. (1,014.) Built in '95 by city. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 100,000 galls.; deep-well, from Contrs. Slack used; av. cost, $1.90 per short ton. TANK.—Cap., 77,000 galls.; wood, on 60-ft. steel tower, latter being on ground 50 ft. above business part of town. FISCAL YEAR CLOSED Nov. 1, '96. DISTRIBUTION.—Taps, about 100; made by plumbers for $3 each, no fee to city. Services, galv. i.; paid for by property owner. Meters: 30; owned and repairs paid by property owner; controlled by city; compulsory for lawn sprinkling, hotels, barns, etc. City can compel use of meters and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 25,000. One steam fire engine is owned, but not used. FINANCIAL.—Cost, about $12,000. Bonded debt, $10,000, at 5%. Expenses: Operating, $600. MANAGEMENT.—Mayor, H. M. Woolly; Secy., C. A. Pratt; Ch. Pump. Engr., F. S. White. Rept. by Supt., F. H. Best, Jan. 7, '97. SEWERS.—None.

152. **UNION,** Hardin Co. (514.) Built by town. Engrs. and Contrs., Jackson & Moss, Des Moines. SUPPLY.—Shallow well, pumping to tank. PUMP.—Steam. TANK.—Cap., 31,000 galls.; on 30-ft. steel tower. DISTRIBUTION.—Mains, 1 mile. Services, galv. i. FINANCIAL.—Cost, $4,500. Rept. by Contrs., Feb., '97.

153. **VAIL,** Crawford Co. (538.) Built in '96 by city; put in operation Dec. 1. Contr., B. P. Egan, Nebraska City, Neb. SUPPLY.—Wells, pumping to tank. PUMP.—Curtis, driven by windmill. TANK.—Cap., 38,000 (?) galls.; cypress, 18 × 20 ft. (Contr. rept. 20 × 18), on 12-post tower 30 ft. high. DISTRIBUTION.—Taps, 8; made by consumer for $6. Services, galv. i.; paid for by consumer. Meters, 0. Any consumer may have a meter. Hydrants, public, 9; private, 6. CONSUMPTION.—(Galls.) av., 2,000. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost, $4,000. Rept. by B. P. Egan, Dec. 14, '96. SEWERS.—None.

—? **VICTOR,** Iowa Co. (616.) Rept. as having works.

154. **VILLISCA,** Montgomery Co. (1,744.) Built in '86 by town. SUPPLY.—Wells, supplied by springs, pumping to tank. PUMP.—Knowles. TANK.—Cap., 47,000 galls.; 20 × 20 ft. DISTRIBUTION.—Mains, 1.3 miles. Taps, 75. Meters, 2. Hydrants, 12. PRESSURE.—Ordinary (in '88), 60 lbs. FINANCIAL.—Cost, $14,500. Bonded debt, $8,000, at 6%. Expenses, $980: Operating, $500; int., $480. Revenue: Consumers, $800. NOTE.—No rept. since '90-1 Manual. SEWERS.—Partial system.

155. **VINTON,** Benton Co. (2,865.) Built in '88 by town. SUPPLY.—Two artesian wells and one large surface well for domestic use, Cedar River for fire protection, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Gordon comp. cond. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 5.6 miles. Taps, 300. Hydrants, 51. FINANCIAL.—Cost, $45,000. Bonded debt, $29,000, at 5%, due in 1906. Expenses, $2,615: Operating, $1,165; int., $1,450. Revenue, $3,635. MANAGEMENT.—Chn., Frank Wilson. Rept. by Mayor, Matthew Brown, and Cy. Clk., J. E. Whipple, Sept., '96.

F 17. **WALKER,** Linn Co. (Est., 435.) Built in '94 by city for fire protection. Engr., W. Wynn, Cedar Rapids. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. Supply, deep well, pumping to tank. Pump, steam. Tank, cap., 34,000 galls.; wood, 16 × 20 ft., on tower 65 ft. high. Fiscal year closed Oct., '96. Mains, 1,620 ft. Hydrants, public,

7. Cost, $4,000. Floating debt, $3,500, at 6%. Secy., W. J. Niebert. Rept. by Prest., O. C. Swartz, Dec. 12, '96. Sewers, none.

156. **WALL LAKE,** Sac Co. (439.) Built in '93 by Co., composed of "Indiana stockholders." Engrs. and Contrs., U. S. Wind Engine & Pump Co. FRANCHISE.—City to pay $25 per hydrant per yr. No legal difficulties. SUPPLY.—Well, pumping to tank. PUMP.—Driven by windmill and steam. Bituminous coal used; av. cost, $3 per short ton. TANK.—Cap., 33,000 galls.; pine, 16 x 22 ft., on 36-ft. pine trestle. DISTRIBUTION.—Mains, 2½ miles. Taps, 90; made by consumer for $10. Services, ¾-in. galv. i.; paid for by property owner. Use of meters optional with consumer. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 11,000. PRESSURE.—Ordinary, 35 lbs. FINANCIAL.—Cost, about $5,000. Revenue, City, fire protection, $250. MANAGEMENT.—Secy., L. J. Gifford; Treas., C. Goodnow; Ch. Pump. Engr., T. Appleyard. Rept. by Prest., C. A. Johnston, Oct. 24, '96. SEWERS.—None.

157. **WALNUT,** Pottawattamie Co. (811.) Under construction in '96 by city; put in operation in July. Engr., A. A. Richardson, Lincoln, Neb. Contr., B. P. Egan, Nebraska City, Neb. SUPPLY.—Deep wells, pumping to tank. PUMPS.—Cap., 600,000 galls.; 2—300,000 Cook. Lump coal used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 58,000 galls.; steel, 10 x 100 ft. DISTRIBUTION.—Mains, 2½ miles. Taps, 160; made by city for $8, including service to curb. Meters, 0. Use of meters optional with consumer. Hydrants, public, 24; private, 30. PRESSURE.—Ordinary, 85 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $11,000. Rept. by Contr., June 25, '96. SEWERS.—None.

158. **WASHINGTON,** Washington Co. (3,235.) Built in '91 by city. SUPPLY.—Deep well, 1,611 ft. deep, pumping from reservoir to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Deane dup.; also Cook deep-well. Run of mine coal used; av. cost, $1.55 per short ton. RESERVOIR.—Cap., 30,000 galls. STAND-PIPE.—Cap., 127,000 galls.; 14 x 100 ft. DISTRIBUTION.—Mains, 7 miles; cost extensions met by tax. Taps, 300; made by city, free. Services, galv. i.; paid for by consumer. Meters: 125; owned and repairs paid by consumer; controlled by city. Use of meters compulsory for consumers of all classes. Hydrants, public, 57. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 47 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost (in '91), about $25,000. Operating expenses, $2,000. Revenue, $2,500. MANAGEMENT.—Rept. by Supt. and Ch. Pump. Engr., St. Clair Lewis, July 9, '96. PROJECTED IMPROVEMENTS.—New deep well. SEWERS.—Has storm sewers.

159. **WATERLOO,** Black Hawk Co. (6,674.) Built in '86 by Waterloo Water-Works Co. FRANCHISE.—20 yrs. from '86; provides for optional purchase of works by city. Rates are fixed in franchise. Co. is exempt from local taxes. City to pay $37 each per yr. for first 100 hydrants and $40 for each additional one. No legal difficulties. SUPPLY.—Cedar River, pumping direct or to reservoir or stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Gordon. (Makers rept. 1,690,000 Deane comp. dup. furnished in '92). Slack coal used; av. cost, $1.50 per short ton. FILTERS.—Cap., 700,000 galls.; Jewell, gravity. RESERVOIRS.—Cap., 83,000 galls. STAND-PIPE.—Cap., 112,000 galls.; steel; 15 x 85 ft. DISTRIBUTION.—Mains, 12 miles; cost extensions met by Co. Taps, 800; made by Co. for $1. Services, galv. i.; paid for by consumer. Meters, 22; owned, controlled and repairs paid by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 121. CONSUMPTION.—(Galls.) av., 700,000; max., 800,000; min., 600,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Cost (in '90), $89,000. Cap. Stock (in '90), $125,000. Bonded debt, $115,000, at 6%. Expenses: Operating, $8,024; int., $6,900. Revenue, $15,644: Consumers, unmetered, $8,080; metered, $850; City, fire protection, $4,440; street sprinkling, $250; other purposes, $2,074. MANAGEMENT.—Prest., C. W. Mullan; Supt., J. P. Berry. Rept. by Secy. and Treas., J. E. Sedgwick, June 25, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Jewell filers, Eng. News, May 28, '96.

160. **WAUKON,** Allamakee Co. (1,610.) Built in '96 by town; put in operation Aug. 15. Engr., Fremont Turner. Contrs., Crellin & Lovell. SUPPLY.—Well, pumping to tank. PUMP.—A 6 x 36-in. upright Stilwell-Bierce & Smith-Vaile. STAND-PIPE.—Cap., 115,000 galls; 14 x 100 ft. DISTRIBUTION.—Mains, cost extensions met by town. Taps made by town for $3. Services, paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 22. FINANCIAL.—Cost, 16,000. Bonded debt, $11,500, at 5%; due 1906. MANAGEMENT.—Prest., M. W. Eaton, Mayor. Secy., C. L. Bearce; Supt., H. J. Bently. Rept. Aug. 5, '96. SEWERS.—None.

161. **WAVERLY,** Bremer Co. (2,346.) Built in '90-1 by city. SUPPLY.—Well and river, pumping direct. PUMPS.—Cap., 2,500,000 galls.; Smith-Vaile, 1,000,000 and 1,500,000. DISTRIBUTION.—Mains, 5 miles. Taps, 190. Hydrants, public, 34. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $19,000, at 5%. MANAGEMENT.—Rept. by Mayor, W. C. Holt, Sept. 21, '96.

162. **WEBSTER CITY,** Hamilton Co. (2,829.) Built in '83 by village. SUPPLY.—Artesian well, pumping to tank and direct. PUMPS.—Cap., 2,000,000 galls.; windmill, with Knowles' steam for fire protection and calm weather. TANK.—Cap., 58,000 galls.; wooden; 20 x 30 ft., on 30-ft. timber trestle 70 ft. above business portion of town. DISTRIBUTION.—(In '88.) Mains, 1.5 miles. Taps, 100. Hydrants, 15. PRESSURE.—

(In '88.) Ordinary, 20 lbs.; fire, 125. FINANCIAL.—(In '88.) Cost, $21,000. Bonded debt, $13,000, at 6%. Expenses, $1,980: Operating, $1,200; int., $780. Revenue: Consumers, $1,000. NOTE.—No rept. since '89-90 Manual. SEWERS.—Has sewers. REFERENCE.—Eng. News, Oct. 3, '85.

F 18. **WELLMAN,** Washington Co. (443.) Built in '96 by town; put in operation in Nov. Engrs. and Contrs., Jackson & Moss, Des Moines. Supply, open well, 10 x 27 ft., pumping to tank. Pump, cap., 200,000 galls.; Smith-Vaile dup. steam. Tank, cap., 33,000 galls.; wood; on 40-ft. steel tower. Mains, 1.1 miles. Hydrants, public, 13. Pressure, ordinary, 60 lbs. Cost, $5,115. Rept. by Contrs., Feb. 11, '97. No sewers.

163. **WEST BEND,** Palo Alto Co. (825.) Built in '95 by city; put in operation Oct. 1. Engrs., Jackson & Moss. Contrs., Crellin & Lovell; all of Des Moines. SUPPLY.—Well, 381 ft. deep, pumping to tank. PUMP.—Cap., 24,000 galls.; steam. Illinois coal used; av. cost, $4 per short ton. TANK.—Cap., 41,000 galls.; wood, on 70-ft. steel tower. DISTRIBUTION.—Mains, ½ mile. Taps, 25; made by city for $12. Services, ¾-in. w. i.; paid for by consumer from curb. Hydrants, public, 9. CONSUMPTION.—(Galls.) av., 4,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $5,600. Bonded debt, $3,100. MANAGEMENT.—Ch. Pump. Engr., Frank Seaver. Rept. by Mayor and Supt., E. W. Buchman, July 27, '96. SEWERS.—None.

F 19. **WEST BURLINGTON,** Des Moines Co. (836). Built in '87-8 by village for fire protection only. Water is supplied from Chicago, Burlington & Quincy Ry. pumping station by meter. Mains, 2,280 ft. Hydrants, public, 8; private, 0. Pressure, 45 to 135 lbs. Cost, $4,000. Debt, floating, $3,200; int., $192. Rept. by V. A. Johnson, Town Recorder, July 8, '96.

164. **WEST LIBERTY,** Muscatine Co. (1,268.) Built in '87-9 by town; enlarged in '92. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 570,000 galls.; Deane dup. Steam and slack coals used; av. cost, $1.50 to $1.80 per short ton. TANK.—Cap., 50,000 galls.; cypress; on 50-ft. wood tower. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 3¾ miles. Taps, 340; made by consumer. Services, galv. i.; paid for by property owner. Meters, 8; owned, controlled and repairs paid by town. Use of meters compulsory for hotels, livery stables and stock. Town can compel use of meters and any consumer may have one. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 38,000; max., 100,000; min., 27,500. PRESSURE.—Ordinary, 30 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $12,000, at 6%. Expenses: Operating, $1,105; int., $784. Revenue: Consumers, unmetered, $2,009; metered, $100; City, street sprinkling, $30; other purposes, $42. Deficits are met by taxation, out of general fund. MANAGEMENT.—Mayor, Jno. McIntosh; Recorder and Treas., W. S. Luse; Ch. Pump. Engr., C. A. Barnes. Rept. by Supt., C. E. Chesebrough, June 13, '96. PROJECTED IMPROVEMENTS.—Additional supply; new well is being bored. SEWERS.—None.

165. **WEST UNION,** Fayette Co. (1,676.) Built in '92 by city. SUPPLY.—Pumping to stand-pipe. FINANCIAL.—Cost, about $15,000.

166. **WHEATLAND,** Clinton Co. (569.) Built in '92 by town; put in operation in Oct. Contrs., Moline (Ill.) Pump Co. SUPPLY.—Drilled well, pumping to tank. PUMP.—Driven by windmill, supplemented by gasoline engine. TANK.—Cap., 47,000 galls.; wood; 20 x 20 ft., on wooden tower 40 ft. high. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, ¼ mile. Taps, 25; made by town. Services, c. i.; paid for by town. Meters, 0. Use of meters optional with consumer, if he pays for it. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 750. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $5,600. Bonded debt, $2,700, at 6%; due annually. Sinking Fund: $360. Operating expenses, $150; int., $162. Consumers, unmetered, $150. Int. and sinking fund are paid by taxation. MANAGEMENT.—Treas., H. Kohberg; Ch. Pump. Engr., H. Martens. Rept. by Town Recorder, A. M. Hall, June 12, '96. SEWERS.—None. REFERENCE.—Stand-pipe accident, Eng. News, May 3, '94.

167. **WILLIAMS,** Hamilton Co. (Township, 709.) Built in '96 by city. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—5-in. drilled well, pumping to tank. PUMP.—Driven by windmill. TANK.—Cap., 10,000 galls.; 12 x 12 ft., on 70-ft. wooden tower. DISTRIBUTION.—Mains, 1 mile; cost extension met by taxation. City can compel use of meters and any consumer may have one. Hydrants, public, 7. FINANCIAL.—Cost, $4,500. Rept. by F. W. Tomlinson, June 12, '96. SEWERS.—Has storm sewers only.

168. **WILLIAMSBURG,** Iowa Co. (635.) Built by city; put in operation Jan. 1, '94. Engr., Geo. Wynn, Cedar Rapids. Contrs., Fairbanks, Morse & Co., Chicago, Ill. SUPPLY.—Two 6-in. wells, pumping to tank. Wells are 200 and 100 ft., on hill and bottom land, respectively. PUMPS.—Cap., 63,000 galls.; driven by Jarecki windmill, with steam when necessary. Windmill on top of tank; elev. 117 ft. Slack coal used; av. cost, $0.75 per short ton. TANK.—Cap., 63,000 galls.; on wooden trestle. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 2 miles; cost extensions met by general fund. Taps, 120; made by city for $1 each. Services, galv. i.; paid for by consumers. Meters, 0; yearly rental, $3. Hydrants, 20. CONSUMPTION.—(Galls.) av., 15,750; max., 63,000; min., 3,150. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, est., $10,000. Operating expenses $200; int., $450. Revenue: Consumers, unmetered, $495; R. R. Co., $500. No deficits. MANAGEMENT.—Recorder, T. T. Os-

born. Rept. by Mayor, H. E. Hull, June 23, '96. PROJECTED IMPROVEMENTS.—Larger pumps. SEWERS.—Has storm sewers only.

169. **WILTON JUNCTION,** Muscatine Co. (1,212.) Built in '90-1 by village; put in operation Feb. 1. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 432,000 galls.; Hughes. TANK.—Cap., 35,000 galls. DISTRIBUTION.—Mains, 2 miles. Hydrants, 15. FINANCIAL.—Cost, $9,000. Bonded debt, $11,700, at 6%. NOTE.—No rept. since '90-1 Manual.

170. **WOODBINE,** Harrison Co. (815.) Built in '92 or '94 by city. SUPPLY.—Well and spring, by pumping. FINANCIAL.—Press repts. in '92 stated that $7,900 bonds for works had been voted and that contract had been let for $8,060.

—? **WYOMING,** Jones Co. (704.) July, '96, C. S. Benson wrote that town would put in distribution system and he would build balance of works and operate the whole plant, works to include pump driven by gasoline engine and a reservoir. Contract for mains, he expected, would be let soon. Mayor, E. M. Babcock. No response to later inquiries.

MINNESOTA.

P 1. **ADAMS,** Mower Co. (216.) Press repts., Mar., '97, stated bids for works had just been received. Engr., F. H. Pickle, Winona. Cy.. Recorder rept. in Mar., '97, that contract had been awarded to Fairbanks, Morse & Co., St. Paul, for $5,290.

1. **ADRIAN,** Nobles Co. (671.) Built in '94 by village; put in operation in Oct. Engr., F. F. Vater; Contr., E. T. Sykes; both of Minneapolis. SUPPLY.—Well, pumping to tank and direct. PUMP.—Cap., 950,000 galls.; Deane comp. dup. Youghiogheny bituminous coal used; av. cost, $5.50 per short ton. TANK.—Cap., 35,000 galls.; wood, on tower 30 ft. high. DISTRIBUTION.—Mains, 3 miles. Taps, 30; made by village. Services, galv. i. Meters: 2; owned by consumer; controlled by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 35,000; max., 100,000; min., 15,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $20,000: $7,000, at 7%, due 1907; $13,000, at 6% due 1914. MANAGEMENT.—Supt., H. M. Kellogg; Ch. Pump. Engr., Jno. Grady. Rept. by C. A. Sands, June 13, '96. SEWERS.—None.

2. **AITKIN,** Aitkin Co. (737.) Built in '92 by village; put in operation in Nov. Engr., J. N. Marr. No Contr. SUPPLY.—Mud River or Ripple River, pumping to tank. PUMP.—Cap., 500,000 galls.; Worthington non-comp. high pressure. Wood used; av. cost, $1.25 per cord. TANK.—Cap., 50,000 galls.; Wood, on wood trestle 80 ft. high. DISTRIBUTION.—Taps, 46; made by village for $2.50. Services, lead and iron; paid for by consumer. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 75,000; max., 100,000; min., 50,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Expenses, Operating, $1,000. Revenue, $1,080: Consumers, unmetered, $600; metered, $480. MANAGEMENT.—Prest., J. N. Marr; Recorder, F. E. Seavey. Rept. by Prest., Sept. 12, '96. SEWERS.—Has partial system of sanitary sewers.

3. **ALBERT LEA,** Freeborn Co. (3,305.) Built in '91 by city; put in operation Oct. 15. SUPPLY.—Artesian wells, pumping to tank and direct. PUMP.—Cap., 1,250,000 galls.; Deane comp. dup. TANK.—Cap., 1,000,000 galls. DISTRIBUTION.—(In '91.) Mains, 1.3 miles. Taps, 15. FINANCIAL.—(In '91.) Cost, 35,000. Bonded debt, $20,000 at 5%. NOTE.—No rept. since '90-1 Manual.

4. **ALDEN,** Freeborn Co. (276.) Built in '95 by village; put in operation in Nov. Engr. and Contr., H. O. Olson, Stillwater. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 35,000 galls.; run by gasoline engine. TANK.—Cap., 54,000 galls.; wood; 20 × 28 ft., on 75-ft. tower. FISCAL YEAR CLOSED Nov., '96. DISTRIBUTION.—Mains, ½ mile. Taps, 15; made by consumer. Services, w. i.; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 13; private, 4. CONSUMPTION.—(Galls.) av., 2,000. PRESSURE.—Fire, 40 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $6,000, at 8%; due in payments of $2,000 at the end of 5, 10 and 15 yrs. Sinking Fund: $300, invested at 7%. Expenses: Operating, $240. taxes, none. MANAGEMENT.—Secy., Peter Harrison; Ch. Pump. Engr., C. N. Ostrander. Rept. by Prest. and Supt., J. A. Hazle, Dec. 29, '96. SEWERS.—None.

5. **ALEXANDRIA,** Douglas Co. (2,118.) Built in '89 by city. SUPPLY.—Wells, pumping direct. PUMP.—Cap., 1,000,000 galls.; Worthington comp. non-cond. Wood used; av. cost, $1.50 per cord. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by taxation. Taps, 75; made by consumer, no fee. Services, galv. i.; paid for by consumer. Village can compel use of meters, and any consumer may have one. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 500,000; max., 1,000,000; min., 250,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $21,616. Debt, $20,100: Floating, $2,100, at 7%; Bonded, $5,000, at 6%; due in '99; $5,000, at 6%; due in 1904; $8,000, at 6%; due in 1909. Sinking Fund: $2,031, deposited at 4%. Works are operated in connection with light plant. No deficits. MANAGEMENT.—Council. Ch. Pump. Engr., C. A. Johnson. Rept. by Re-

corder, Jas. Fitzgerald, June 5. '96. PROJECTED IMPROVEMENTS.—Two deep wells are being driven for more and better water. SEWERS.—None.

6. **AMBOY,** Blue Earth Co. (215.) Built in '95 by village; put in operation Dec. 1. Engrs., Fairbanks, Morse & Co., St. Paul. Contrs., Jackson & Moss, Des Moines. SUPPLY.—Well, 8 ins. × 270 ft., pumping to tank. PUMP.—Operated by 6-HP. gasoline engine. TANK.—Cap., 63,000 galls.; wood, on wooden trestle 80-ft. high. DISTRIBUTION.—Mains, ¾ mile. Taps, 12; made by city for $12, including service to curb. Services, ¾-in.; paid for by consumer. Meters, 0. Hydrants, public, 9. PRESSURE.—Ordinary and fire, 47 lbs. FINANCIAL.—Cost, $5,300. MANAGEMENT.—Prest., B. O. Killmer; Secy., F. E. Cooper; Supt. and Ch. Pump. Engr., C. F. Tackels. Rept. by Prest., Jan. 3, '97. SEWERS.—None.

7. **ANOKA,** Anoka Co. (4,252.) Built in '89 by city. FRANCHISE.—20 yrs. SUPPLY.—Rum River, pumping direct. PUMPS.—Cap., 1,750,000 galls.; make not given, but makers rept. 1,000,000 Barr. DISTRIBUTION.—(In '89.) Mains, 4.3 miles. Taps, 168. Hydrants, (?)128. PRESSURE.—(In '89.) Ordinary, 80 lbs.; fire, 140 lbs. FINANCIAL.—(In '89.) Cost, $32,000. Bonded debt, $32,000, at 6%; due in '98. Expenses, $3,727: Operating, $1,807; int., $1,920. Revenue, $5,002: Consumers, $2,762; City, $2,240. NOTE.—No rept. since '90-1 Manual.

8. **AUSTIN,** Mower Co. (3,901.) Built in '87 by city. SUPPLY.—Two artesian wells, flowing into collecting reservoir, thence pumping direct. PUMPS.—Cap., 2,250,000 galls.; two Smedley. Illinois bituminous coal used; av. cost, $3.25 per short ton. RESERVOIR.—Cap., 90,000 galls.; collecting, of masonry, covered. FISCAL YEAR CLOSED Feb. 28. DISTRIBUTION.—Mains, 7 miles; cost extensions met by general tax. Taps, 430; made by city for $2.50 each. Services, lead; paid for by property owner. Meters: 4; owner, controlled and repairs paid by city; yearly rental, none. Use of meters optional with consumer; compulsory for R. Rs. and manufacturers. Hydrants, public, 62; private, 1. CONSUMPTION.—(Galls.) av., 353,000; max., 464,000; min., 242,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 120 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $25,000, at 6%; due in 1901. Expenses, $5,000: Operating, $3,500; int., $1,500. Revenue, $7,350: Consumers, unmetered, $3,250; metered, $450; City, fire protection, $3,000; street sprinkling, $200; sewer flushing, $450. No deficit. MANAGEMENT.—Supt., J. M. Greenman; Ch. Pump. Engr., Wm. Todd. Rept. by Supt., Aug. 8, '96. SEWERS.—Has sanitary sewers only.

—? **BELLINGHAM,** Lac qui Parle Co. (166.) Built in '92 by city; put in operation Oct. 1. Contrs. (wholly or in part), U. S. Wind Engine and Pump Co., Batavia, Ill. SUPPLY.—Wells, pumping to tank. PUMP.—Driven by windmill. TANK.—Cap., 88,000 galls. DISTRIBUTION.—Hydrants, public, 4; private 1. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $4,000. MANAGEMENT.—Village officers; Prest., W. W. Holmes: Secy., C. E. Krouss.

9. **BIWABIK,** Saint Louis Co. (365.) Built in '92 by village. SUPPLY.—Well, pumping to tank. PUMPS.—Cap., 630,000 galls; 415,000 Crawford dup., and 215,000 Cameron. TANK.—Cap., 67,000 galls. Wood, 24 × 20 ft. DISTRIBUTION.—Mains, 1,700 ft.; cost extensions met by village funds. Taps, 3; made by village. Services, ¾-in.; paid for by property owner to curb. Meters, 0. Village cannot compel use of meters. Hydrants, public, 7. Consumption.—(Galls.) av., 10,000; max., 17,000.; min., 7,000. PRESSURE.—Ordinary, 43 lbs. FINANCIAL.—Cost, $12,000. Floating debt $2,000. Expenses, operating, $1,800. MANAGEMENT.—Ch. Pump. Engr., Swan Moren. Rept. by F. A. Dailey, Recorder, Aug. 19, '96. SEWERS.—None.

P 2. **BLOOMING PRAIRIE,** Steele Co. (308.) Village talks of building works in '97. Supply, well, pumping to tank. Est. cost, $5,000. Rept. by M. M. Guthrie, Sept., '96.

10. **BLUE EARTH CITY,** Faribault Co. (1,569.) Built in ? by village. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Wells, one 10-in. and one 8-in., 1,300 ft. deep, pumping to tank and direct. PUMPS.—Cap., 1,000,000 galls.: 500,000 Fairbanks dup. and 500,000 Smith-Vaile; run in connection with electric light plant. TANK.—Cap., 61,000 galls.; wood, on wooden trestle 50 ft. high. DISTRIBUTION.—Mains, 6 miles. Hydrants, public, 53. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $27,000. MANAGEMENT.—Mayor, Otto Kaupp. Rept. by Fairbanks, Morse & Co., Dec. 14, '96.

11. **BRAINERD,** Crow Wing Co. (5,708.) Built in '83 by Brainerd Water Co. Receiver appointed in '90. Press rept., Oct., '96, indicated Co. had been reorganied as Minnesota Water-Works Co.; also stated that Co. proposed to extend intake, add filters and improve pipe system, provided city would pay hydrant rental retained on account of alleged deficient pressure. SUPPLY.—Mississippi River, pumping direct. PUMPS.—Cap., 2,000,000 galls.; Blake cond. dup. DISTRIBUTION.—(In '89.) Mains, 14.5 miles. Taps, (in '88,) 700. Hydrants, 79. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Revenue, City (in '90), $3,950. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 10, '85.

12. **BRECKENRIDGE,** Wilkin Co. (655.) Built in '91 by village. SUPPLY.—River, pumping to tank. PUMPS.—Cap., 500,000 galls.; Smith-Vaile dup. TANK.—Cap., 55,000 galls; on 80-ft. wooden tower. DISTRIBUTION.—Mains (in '90.), 1 mile.

Hydrants, 12. FINANCIAL.—(In '90.) Cost, $10,600. Bonded debt, $10,000. NOTE.—No rept. since '90-1 Manual.

13. **BROWNTON,** McLeod Co. (384.) Built in '95 by village. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—6-in. well, 304 ft. deep, pumping to tank. PUMPS.—Driven by 7-HP. Fairbanks-Morse gasoline engine. TANK.—Cap., about 60,000 galls.; wood, on wooden tower 85 ft. high. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 0.66 mile. Taps, 3; made by village. Services, iron; paid for by consumer. Meters: 1; owned, controlled and repairs paid by village. Use of meters optional with consumer; compulsory for R. R. Co. Hydrants, public, 9. FINANCIAL.—Cost, $6,327. Bonded debt, $6,000, at 6%, due in 1905. MANAGEMENT.—Supt. and Ch. Pump. Engr., M. W. Arnold. Rept. by Recorder, F. L. Nichols, June 10, '96. SEWERS.—Has sanitary and storm sewers.

14. **CALEDONIA,** Houston Co. (927.) Built in '94 by village. Engr. and Contr., Fremont Turner, Des Moines, Ia. SUPPLY.—Well, 300 ft. deep, pumping to stand-pipe and direct. PUMPS.—Cap., about 12,000 galls. Wood used; av. cost, $2.00 per cord. STAND-PIPE.—Cap., 64,000 galls.; steel, 10 × 110 ft. DISTRIBUTION.—Mains, ½ mile. Taps, 9. Services, galv. i.; paid for by consumer. Use of meters optional with consumer. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 6,300; max., 15,750; min., 1,575. PRESSURE.—Ordinary, 50 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $8,000, at 5%, due in 10 yrs. Expenses, $980: Operating, $500; int., $480. Revenue, $450: Consumers, unmetered, $225; street sprinkling, $25; other purposes, $200. MANAGEMENT.—Prest., Jos. Vossen; Ch. Pump. Engr., Thos. Abbots. Rept. by Secy., John Bouquet, June 10, '96.

15. **CANNON FALLS,** Goodhue Co. (1,078.) Built in '87-8 by village. SUPPLY.—Well, pumping to reservoir. PUMP.—Operated by windmill. RESERVOIR.—Cap., 95,000 galls.; 152 ft. above town. DISTRIBUTION.—Mains: Cost extensions met by city funds. Taps (in '90), 15. Hydrants, public, 6. PRESSURE.—Fire, 75 lbs. FINANCIAL.—Cost, $7,200. Debt, $5,000, at 7%. MANAGEMENT.—Rept. by Prest., F. B. Seager, June 5, '96.

—? **CHATFIELD,** Fillmore Co. (1,335.) Built in about '94 by city; evidently quite an extensive plant for general supply.

D 1. **CLOQUET,** Carlton Co. (2,530.) Built in '86 by Cloquet Water Co. for domestic use. St. Louis River pumping to tank. Cost, $1,000. No rept. since '90-1 Manual.

16 **CROOKSTON,** Polk Co. (3,457.) Built in '82 by Crookston Water-Works, Power & Light Co. SUPPLY.—Red Lake River, drainage area, 53 square miles, pumping direct. PUMPS.—Cap., 2,500,000 galls.: 1,250,000 Worthington non-comp. high pressure; also water-power pump. DISTRIBUTION.—Mains, 6.5 miles. Taps, 125. Meters, 25. Hydrants, public, 42. CONSUMPTION.—(Galls.) av., 200,000. FINANCIAL.—Bonded debt, $100,000, at 7%, which covers the water power, water-works and electric light plants. Revenue, about $25,000: Consumers, unmetered, $6,000; City, fire protection, $4,120; other sources than water rentals, $15,000. MANAGEMENT.—Rept. by owner and Genl. Mgr., W. J. Murphy, Minneapolis, Oct. 30, '96. REFERENCE.—Eng. News, July 26, '84.

—? **DELANO,** Wright Co. (889.) Built since '94 by village.

17. **DETROIT CITY,** Becker Co. (1,510.) Built in '91 by village; put in operation Jan., '92. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Surface well, pumping to tank and direct. PUMP.—Cap., 700,000 galls.; Smith-Vaile dup. TANK.—Cap., 56,000 galls.; wood, on wooden tower 90 ft. high. DISTRIBUTION.—Mains, 1¼ miles. Services, w. i.; paid for by consumer. Hydrants, public, 13. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $12,800. Bonded debt, $12,000. MANAGEMENT.—Vill. Prest., Geo. D. Hamilton. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

18, P 3. **DULUTH,** Saint Louis Co. (33,115 + 4,265, in annexed districts.) Built in '83 by Duluth Gas & Water Co. In '90, Lakeside Light & Water Co., controlled by Duluth Co., built works; in '91, West Duluth Gas & Water Co. built distribution system, buying water from Duluth Co., through main laid by latter. Jan. 1, '93, Lakeside was annexed to Duluth; West Duluth has also been annexed since '91, and its works are now controlled by Duluth Co. FRANCHISES.—Duluth and Lakeside, each 30 yrs. Duluth franchise exclusive; provides for purchase of works by city at intervals of 5 yrs., price to be determined by appraisers. LEGAL DIFFICULTIES.—City took steps in '96 to annul franchise, alleging that it had been forfeited through the furnishing of impure water, which caused typhoid fever. Decision not rept. yet. There has been trouble, also, regarding hydrant rentals. See proposed municipal works, below. SUPPLY.—Lake Superior, pumping to reservoir. PUMPS.—Cap., 10,000,000 (?) galls.: 2,000,000 Blake; 3,000,000 Worthington comp. cond.; these two rept. in '89; makers also rept. 5,000,000 Holly-Gaskill hor. high duty. There was a 1,100,000 Blake pump at Lakeside station. RESERVOIRS.—Cap., about 4,000,000 galls. Old: 500,000 galls.; 265 ft. above pumps. New: Cap., 3,500,000 galls.; 275 ft. above pumps. DISTRIBUTION.—(In '91, including Lakeside.) Mains, 34 miles. Taps, 1,260. Meters, 99. Hydrants, 230. PRESSURE.—(In '89.) Ordinary, 20 to 90 lbs. FINANCIAL.—(In '90.) Cost, $1,079,046. Cap. Stock, authorized, $500,000; all paid-up; paid 3% div'd in '89. Bonded debt, $751,000: $177,000, at 6%; $574,000, at 5%. Expenses, $49,559: Operating, $16,516; int., $29,746;

taxes and insurance, $3,297. Revenue, $67,732: Consumers, $47,198; fire protection, $20,534. NOTE.—No rept. since 90-1 Manual. REFERENCE.—Eng. News, June 14, '84.

PROPOSED MUNICIPAL WORKS.

In '96, city began construction of 60-in. steel intake, 1,500 ft. long, pumping station and 42-in. steel force main 3 to 6 miles long, to form part of municipal plant. Cy. Engr., W. B. Patten. Consult. Engr., L. W. Rundlett, St. Paul. Since '91, various propositions for municipal works have been voted on, some involving the purchase of both the water and light plants of the Co., and others the construction of complete or partial works by city. Several elections have been pronounced carried and subsequently upset in court, latest one being in fall of '96, when city voted to buy out plant. Separate negotiations for purchase of West Duluth plant were under way at close of '96. Mar. 24, '97, Cy. Engr. rept. city contemplates complete independent plant, but at present is constructing only portions named above and supply main to connect with Co.'s mains. Bonds to the amount of $1,106,000 have been sold. Work under contract and necessary to make connection with Co.'s mains est. to cost $750,000; balance of available funds to be used either to parallel Co.'s mains, or to lay pipe in parts of city not now supplied.

19. **EASTON,** Faribault Co. (180.) Built in '94 by village; put in operation Nov. 1. Contrs., Schneider, Trick & Lepper, Blue Earth City. SUPPLY.—Pumping to tank. PUMP.—Operated by windmill. TANK.—Cap., 50,000 galls.; elevated about 50 ft. DISTRIBUTION.—Persons may use all the water they wish, free; there are no charges for tapping or providing service connections. FINANCIAL.—Cost, $4,000. No debt. Rept. by Clk., F. W. Rath.

F 1. **ECHO,** Yellow Medicine Co. (Township, 347.) Fire protection works built by village about '95. Supply, well, pumping to tank. Cost, $4,000. Recorder, J. I. Martin.

20. **ELGIN,** Wabasha Co. (Township, 885.) Built in '95 by village; put in operation in June. Engrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Well, pumping to tank. TANK.—Cap., 35,000 galls.; wood, on 80-ft. (?) trestle. DISTRIBUTION.—Mains: Cost extensions met by village funds. Taps, 25; made by consumer. Services, galv. i.; paid for by consumer. Meters: 6; owned and repairs paid by consumer; controlled by village; yearly rental, none. Use of meters optional with consumer. Hydrants, public, 8; private, 6. CONSUMPTION.—(Galls.) av., 4,000; max., 6,000; min., 2,000. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $5,000. Floating debt, $1,500, at 7%. Expenses, Operating, $200. Revenue, $200: Consumers, unmetered, $150; metered, $50. Deficits are met by village fund. MANAGEMENT.—Rept. by Prest., J. W. Bryant, Sept. 7, '96. SEWERS.—None.

F 2. **ELY,** Saint Louis Co. (901.) Built in '89 by village for fire protection only.

F 3. **ELYSIAN,** Le Sueur Co. (348.) Built in '95 by city; put in operation in Oct. Supply, deep well, pumping to tank. Pump, operated by windmill. Tank, cap., 75,000 galls., on steel tower 60 ft. high. Mains, 2,800 ft. Hydrants, public, 8. Pressure, ordinary, 40 lbs. Rept. by C. F. Johnson, Jan. 10, '97. Sewers, none.

21. **EVELETH,** Saint Louis Co. (Est., 764.) Built in '95 by village; put in operation July 1. SUPPLY.—Springs, 40 ft. above pumps, by gravity, with pumping in case of fire. PUMPS.—Cap., 500,000 galls.; 2—250,000 Prescott dup. Wood used. RESERVOIRS.—Cap., 90,000 galls.; storage, 60,000; distributing, 30,000. DISTRIBUTION.—Mains, ¾ mile; cost extensions met by bonds. Taps, 38; made by village for $16, including service to curb. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary, 18 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $6,000. Bonded debt, $2,000, at 7%, due in '97. Expenses, Operating, $1,250. Revenue, $1,030: Consumers, unmetered, $430; City, fire protection, $600. MANAGEMENT.—Secy., Ed. Finch. Rept. by Supt., Thos. D. Sullivan, June 28, '96. PROJECTED IMPROVEMENTS.—A stand-pipe and moving of pumping station. SEWERS.—None.

F 4. **FAIRFAX,** Renville Co. (351.) Built in '90 by city. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. Supply, 6-in. well, pumping to tank. Pump, cap., 400,000 galls.; operated by gasoline engine. Tank, cap., 63,000 galls. Mains, 1 mile. Hydrants, public, 6. Pressure, 40 lbs. Cost, $6,000. Debt, $4,000, at 7%; floating. Rept. by Vill. Prest., Paul Albrecht, Feb. 1, '97. No sewers.

22. **FAIRMONT,** Martin Co. (Township, 437.) Built in (?) by village. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 150,000 galls.; Smith-Vaile artesian. TANK.—Cap., 65,000 galls.; wood, on wooden tower 80 ft. high. DISTRIBUTION.—Mains, ¾ mile. Hydrants, public, 11. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $9,000. MANAGEMENT.—Village Council: Prest., F. W. Betz. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

23. **FARIBAULT,** Rice Co. (6,520.) Bought by city in '93 for $101,259 (press rept.); built in 83-4 by Faribault Water-Works Co. FRANCHISE.—25 yrs. SUPPLY.—Surface wells, pumping to reservoir. First well, 20 × 19 ft., sunk through gravel to sandstone; second well, 30 ft. in diam. PUMPS.—Cap., 1,000,000 galls.; Deane, high and low pressure cond. dup. RESERVOIRS.—Cap., 750,000 galls.; 80 × 23 ft.; roofed; 219 ft. above city and 285 ft. above pumps. DISTRIBUTION.—(In '87.) Mains, 7 miles. Taps, 106. Me-

ters, 8. Hydrants, 59. PRESSURE.—(In '87.) Ordinary, 96 lbs. FINANCIAL.—(In '87.) Cost, $140,000. Bonded debt, $80,000, at 6%. Expenses, $7,600: Operating, $2,800; int., $4,800. Revenue, $8,010: Consumers, $3,000; City, $5,010. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, June 21, '84.

24. **FERGUS FALLS,** Otter Tail Co. (3,772.) Built in '83 by Fergus Falls Water Co.; owned by Theo. C. Woodbury and E. A. Noyes since Dec. 14, '95, as a reorganization committee for bondholders. FRANCHISE.—30 yrs. from '83. Rates are subject to regulation by city ordinance. Co. is not exempt from local taxes. City to pay $4,300 per yr. for public service (see below). LEGAL DIFFICULTIES.—Suit now pending to cancel hydrant contract. About '93 or '94, city refused to pay hydrant rental, claiming it was excessive and council that made contract exceeded its powers. U. S. Circuit Court gave verdict for Co., but U. S. Court of Appeals decided case was one for state courts. Works went into hands of receiver. Latter part of '96, compromise was made, reducing hydrant rental from $80 to $60 each. SUPPLY.—Red River, pumping direct. PUMPS.—Cap., 4,250,000 galls.; 2—1,500,000 water-power and 1,250,000 steam, Worthington. DISTRIBUTION.—Mains, 8 miles. Taps, 400; made by Co. for $2. Services paid for by consumers. Meters: 2; owned, controlled and repairs paid by Co. Use of meters optional with consumer; compulsory for R. Rs. and public institutions. Hydrants, public, 44; private, 1. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. One steam fire engine is owned by city, but not used. FINANCIAL.—(In '88.) Cost, $168,000. Cap. Stock, $82,000. Bonded debt, $88,000, at 6%. Sinking Fund, $3,016. Expenses, $5,863: Operating, $583; int., $5,280. Revenue, $13,450: Consumers, $7,450; City, $6,000. MANAGEMENT.—Ch. Pump. Engr., W. J. Leach. Rept. by C. D. Wright, ex-Receiver, in charge of plant, June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 2, '84.

P 4. **FERTILE,** Polk Co. (273.) Bonds for works were voted in spring of '96 and plans made in Aug., '96, by C. F. Loweth, St. Paul. Contracts will probably be let in spring of '97. Supply, river, lifted by pump driven by 16-HP. gasoline engine to 62,000-gall. wood tank on 90-ft. wood tower. Mains, 6,372 ft. Hydrants, 10. Rept. by Engr., in '96.

P 5. **FOSSTON,** Polk Co. (207.) Bonds were voted in '96 and plans made by C. F. Loweth, St. Paul, but inability to sell bonds led to postponement to '97. Supply, open well, pumping to 54,000-gall. tank on 90-ft. tower. Mains, 3,000 ft. Hydrants, 8. Est. cost, water and electric light plant, $13,000. Rept. by Engr. in '96. Press rept., Feb., '97, stated vote on issue of $11,000 (more?) bonds had been defeated.

P 6. **FRANKLIN,** Renville Co. (284.) Bonds for works voted and sold early in '97 and contracts immediately let to Fairbanks, Morse & Co., St. Paul. Rept. by Recorder, Peter E. Wicken, Feb. 2, '97.

25. **FULDA,** Murray Co. (348.) Built in '95 by village; put in operation in July. Engrs., Pike & Soublette; Contrs., Tobin, Gleason & Smalts, all of Minneapolis. SUPPLY.—Deep well, pumping to tank and direct. PUMPS.—Cap., 784,800 galls.; two Smith-Vaile, 64,800 and 720,000. Iowa bituminous coal used; av. cost, $3.25 per short ton. RESERVOIR.—Storage. TANK.—Cap., 45,600 galls.; wood, 18 × 24 ft., on wood trestle 80 ft. high. FISCAL YEAR CLOSED in Mar. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by tax. Taps, 70, made by village for $10. Services, galv. i.; paid for by property owner. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 14. PRESSURE.—Ordinary, 45 lbs.; fire, 200 lbs. FINANCIAL.—Bonded debt, $10,000, at 6%, due 1906. MANAGEMENT.—Prest., L. L. Rewalt; Ch. Pump. Engr., Jos. Dolan. Rept. by Secy., Robt. Hyslop, June 11, '96.

P 7. **GLENCOE,** McLeod Co. (1,649.) Bids for works were to be received by village Jan. 26, '97. Engrs., Fairbanks, Morse & Co., St. Paul. Supply, deep well, already sunk, pumping to reservoir and tank. Latest rept. by J. L. T. Daner, Recorder, Jan. 4, '97. Press rept., Dec. 15, '96, stated $25,000 of 6% bonds had just been sold.

26. **GLENWOOD,** Pope Co. (627.) Built in '83 by village. SUPPLY.—Spring Creek and springs, by gravity from collecting tank and reservoir. RESERVOIR.—Cap., 200,000 galls.; impounding, formed by earth dam, with automatic valve for fire purposes. TANK.—Cap., 20,000 galls.; for domestic uses. FISCAL YEAR CLOSED Mar. 8. DISTRIBUTION.—Mains, 1¾ miles; cost extensions met by village. Taps, 63. Services, ¾-in. galv. i.; paid for by property owner. Village cannot compel but may prohibit use of meters. Hydrants, public, 16; private, 4. CONSUMPTION.—Unknown; supply abundant. PRESSURE.—Ordinary and fire, 65 to 70 lbs. FINANCIAL.—No accurate records have been kept. Revenue, Consumers, $430. No deficits. MANAGEMENT.—Supt., M. McDougall. Rept. by Recorder, C. L. Peterson, June 5, '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Feb. 14, '85.

F 5. **GOOD THUNDER,** Blue Earth Co. (Est., 421.) Built in '96 (?) by village; put in operation Dec. 10. Engrs. and Contrs., Fairbanks, Morse & Co. Supply, well, pumping to tank. Pump. cap., 100,000 galls.; Fairbanks-Morse, run by 5-HP. gasoline engine. Tank, cap., 63,000 galls.; on trestle 80 ft. high Mains, 1,100 ft. Hydrants, public, 4. Pressure, ordinary, 40 lbs. Cost, $4,500. Bonded debt, $5,000, at 6%, due in 6 to 10 yrs. Expenses, operating, $75. Revenue, city, fire protection, $1,000. Deficits are met by bonds, general fund and liquor license. Ch. Pump. Engr., Geo. Miller. Rept. by Secy., F. L. Austin, Dec. 15, '96. No sewers.

27. **GRACEVILLE,** Bigstone Co. (508.) Built in '92 by village; put in operation in July. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 120,000 galls.; Smith-Vaile artesian. Wood used; av. cost, $2.80 per cord. TANK.—Cap., 56,000 galls.; wood, on wood tower 80 ft. high. FISCAL YEAR CLOSED Nov. 1, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by city. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 15,750; min., 11,025. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $10,500. Bonded debt, $10,000, at 7%, due in 1912. No sinking fund. Expenses, $1,700: Operating, $1,000; int., $700. Revenue, Consumers, $800. Deficits of $500 a yr. are met by special tax. MANAGEMENT.—Secy., H. C. Sholbury; Supt., L. Seeley. Rept. by Prest., M. F. Noonan, Dec. 26, '96. SEWERS.—Has partial sanitary and storm sewers.

28. **GRAND RAPIDS,** Itasca Co. (277.) Built in '94 by village; put in operation in Dec. Engrs., Patten & Frank; Contrs., Anderson & King, all of Duluth. SUPPLY.—Lakes, pumping to tank and direct. PUMPS.—Cap., 378,000 galls.; Crawford. Wood used; av. cost, $2 per cord. TANK.—Cap., 105,000 galls.; wood, 30 × 20 ft., on wooden trestle 60 ft. high. FISCAL YEAR CLOSED Dec. 29, '95. DISTRIBUTION.—Mains, 3 miles; cost extensions met by village. Taps, 40; made for consumer by licensed plumber at $3 each. Services, lead and galv. i.; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 8,000. PRESSURE.—Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $19,000, at 7%, due in 20 yrs. Expenses, Operating, $1,300. MANAGEMENT.—Ch. Pump. Engr., A. Storer. Rept. by Supt., T. H. Hennessy Aug. 3, '96. SEWERS.—None.

F 6. **GRANITE FALLS,** Yellow Medicine Co. (800.) Built in '92 by city for fire protection. Supply, pumping direct. Cost, $2,000. Rept. by Town Clk., Aug. 29, '96.

—? **GROVE CITY,** Meeker Co. (349.) Built in '95 or early in '96 by village. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 75,000 galls.; deep well, run by 7-HP. Fairbanks-Morse gasoline engine. TANK.—Cap., 63,000 galls.; wood, on timber tower 80 ft. high. DISTRIBUTION.—Mains, ½ mile. Hydrants, public, 5. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $5,000. MANAGEMENT.—Village Council. Prest., Rasmus Nelson. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

29. **HECTOR,** Renville Co. (354.) Built in '96 by city; put in operation Aug. 15. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—6-in. artesian well, 370 ft. deep, pumping to tank. PUMP.—Cap., 43,000 galls.; deep well, run by 5-HP. gas engine. TANK.—Cap., 63,000 galls.; wood, 24 × 20 ft., on pine timber trestle 90 ft. high. DISTRIBUTION.—Mains, 1 mile. Taps, 2; made by city. Services paid for by consumer. Meters, 0. City cannot compel use of meters. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 1,000; max., 2,000; min., 200. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Bonded debt, $10,000, at 6%. Expenses, Operating, $200. Revenue, Consumers, $30. MANAGEMENT.—Secy., Jas. Chapman. Rept. by Ch. Pump. Engr., Chas. J. Whitney, Dec. 14, '96. SEWERS.—Has storm sewers only.

P 8. **HENDERSON,** Sibley Co. (909.) Well was to be sunk in '96, and works built in '97. Rept. in June, '96.

30. **HIBBING,** Saint Louis Co. (Est., 1,085.) Bought by village July 1, '95; built in '94; put in operation June 1. Press rept. states works were bought from Hibbing & Gimble, of Duluth, for $11,400. Contrs., Fairbanks, Morse & Co. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 750,000 galls.; Worthington simple high pressure (rept. by makers). TANK.—Cap., 90,000 galls. FINANCIAL.—Purchase price, $11,400, which was apparently met by $11,400 of 7% bonds.

F 7. **HOKAH,** Houston Co. (582.) Built in '95 by village for fire protection. Supply, well, 544 ft. deep, lifted by 7,500-gall. hydraulic ram to 70,000-gall. reservoir one mile distant, said to be 180 ft. above well. Cost, $6,000. Rept. Oct. 21, '96.

31. **HOWARD LAKE,** Wright Co. (610.) Built in '96 by village; put in operation Sept. 15. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Deep well, pumping to tank. PUMP.—Steam. Soft wood used; av. cost, $1.35 per cord. TANK.—Cap., 63,000 galls.; wood. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by taxation. Taps, 50. Services paid for by property owner. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 12. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $10,340. Bonded debt, $7,400: $7,000, at 6%, due 1916; $400, at 6%, due 1908. MANAGEMENT.—Prest., W. J. Tousley. Rept. by Secy., Thos. R. Briggs, Aug. 21, '96. SEWERS.—None.

32. **HUTCHINSON,** McLeod Co. (1,414.) Small domestic works built in '89-91 by Water, Light & Power Co.; present works built in '94 by village; put in operation in Nov. Engr., C. F. Loweth. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—10-in. artesian well, 196 ft. deep, pumping to tank and direct. PUMP.—Cap., 1,000,000 galls.; Fairbanks-Morse comp. dup. Wood used; av. cost, $2 per cord. TANK.—Cap., 100,000 galls.; wood, on steel tower 84 ft. high. DISTRIBUTION.—Mains, 3¼ miles. Taps, 40; made by city for $12. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 45,000.

PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $21,600. Bonded debt, $20,000, at 6%, due in 18 yrs. Expenses, Operating, $250. Revenue, Consumers, $200. Deficits are all met by taxation. MANAGEMENT.—Rept. by Supt. and Ch. Pump. Engr., S. C. Billings, Aug. 8, '96. SEWERS.—None.

33. **JACKSON,** Jackson Co. (720.) Built in '92 by village; put in operation in Dec. Engr., Chas. F. Loweth, St. Paul. Contr., E. T. Sykes, Minneapolis. SUPPLY.—Open well, pumping to tank and direct. PUMP.—Cap., 750,000 galls.; Smith-Vaile dup. Iowa bituminous coal used; av. cost, $3.40 per short ton f. o. b. at Jackson. TANK.—Cap., 60,000 galls.; wood, 24 × 18 ft., on 80-ft. wooden tower on hill. FISCAL YEAR CLOSED Mar. 3. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by taxes. Taps, 69; made by village for $10. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 12,600. PRESSURE.—Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $10,000, at 6%, due in 1902. Sinking Fund: $780, invested in real estate mortgages. Expenses, $1,000: Operating, $400; int., $600. Revenue, Consumers, $475. Deficits are wholly met by taxation. MANAGEMENT.—Treas., Jno. K. Brown; Supt. and Ch. Pump. Engr., A. F. Garlach. Rept. by Secy., Alex. Fiddes, June 12, '96. SEWERS.—Has partial sanitary and storm sewers.

—? **JANESVILLE,** Waseca Co. (921.) Small plant owned by village. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill.

34. **KASSON,** Dodge Co. (992.) Built in '95 by village; put in operation Oct. 15. Engrs., Fairbanks, Morse & Co., St. Paul. Contr., E. E. Hulsten. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 250,000 galls.; Laidlaw-Dunn-Gordon deep well. Av. cost of coal used, $3 per short ton. TANK.—Cap., 68,000 galls.; wood, 22 × 24 ft., on stone tower, 80 ft. high. DISTRIBUTION.—Mains, 0.57 mile; cost extensions met by village fund. Taps, 10 (?); made by consumer. Village can compel the use of meters and any consumer may have one. Hydrants, public, 10 (?). CONSUMPTION.—(Galls.) av., 14,000. FINANCIAL.—Cost, $7,000. Rept. by J. Senthold, Jr. SEWERS.—None.

35. **KENYON,** Goodhue Co. (666.) Built in '98 by village. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Well, pumping to tank. PUMP.—Dup. Indiana bituminous block coal used; av. cost, $4.75 per short ton. TANK.—Cap., 56,700 galls.; wood, on timber trestle 80 ft. high. DISTRIBUTION.—Mains, 1 mile; cost extensions met by consumers benefited. Taps, 44; made for consumer by authorized plumber, at actual cost. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 19. MANAGEMENT.—Rept. by Vill. Prest., J. C. E. Holmen, July 27, '96. SEWERS.—None.

36. **LAKE BENTON,** Lincoln Co. (513.) Built in '94 by village; put in operation June 1, '94. Engr., Chas. F. Loweth, St. Paul. Contrs., Tobin & Gleason, Minneapolis. SUPPLY.—Open well, near Lake Benton, pumping to reservoir and direct. PUMP.—Cap., 200,000 galls.; Gordon dup. Illinois bituminous coal used; av. cost, $5.25 per short ton. RESERVOIR.—Cap., 81,000 galls.; covered masonry; one mile from and 192 ft. above pumping station. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by general tax fund. Taps, 85; made by village for $13.50, including service to curb. Services, iron; paid for by property owner. Meters: 10; owned by consumer; controlled and repaired by village. Use of meters compulsory for lawns and mills. Village can compel use of meters and any consumer may have one. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—Ordinary, 83 lbs.; fire, 100 lbs. FINANCIAL.—Cost, 12,600. Bonded debt, $13,000, at 6%, due in 20 yrs. Expenses: Operating, $400; int., $780. Revenue: $348: Consumers, unmetered, $240; metered, $108. Deficits met by general taxation. MANAGEMENT.—Prest., J. S. Tucker; Secy., Grant Matthews. Rept. by Supt. and Ch. Pump. Engr., Geo. Larson, Aug. 26, '96. SEWERS.—None.

37. **LAKE CITY,** Wabasha Co. (2,128.) Built in '93 by city; put in operation in Aug. Engr., Chas. F. Loweth, St. Paul. Contr., Thos. Botham. Electric light plant in pumping station. SUPPLY.—Open well and river, pumping to tank. PUMP.—Cap., 1,000,000 galls.; Fairbanks-Morse comp. dup. Av. cost coal used, $3.15 per short ton. TANK.—Cap., 100,000 galls.; on 86-ft. wood tower. DISTRIBUTION.—Mains, 4 miles. Taps, 160; made by city for $1. Services, galv. i.; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 37. CONSUMPTION.—(Galls.) av., 85,000; max., 140,000; min., 40,000. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Original cost, $23,500. MANAGEMENT.—Rept. by Supt., Geo. Cornelius, Sept. 2, '96. SEWERS.—None.

—? **LAKE CRYSTAL,** Blue Earth Co. (824.) Built in '94 by village; put in operation in Apr. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Surface well, pumping direct. PUMP.—Cap., 700,000 galls.; Fairbanks-Morse, in flour mill of Graif Bros. Co. DISTRIBUTION.—Mains, ½ mile. Hydrants, public, 8. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $5,000. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

18. **LAKESIDE** (P. O. Lakeview), Saint Louis Co. Now part of Duluth.

38. **LAMBERTON,** Redwood Co. (202.) Built in '95 by village; put in operation Sept. 1, '95. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUP-

PLY.—Deep well, pumping to tank. PUMP.—Cap., 9,000 galls.; driven by windmill. TANK.—Cap., 63,000 galls.; on 100-ft. steel tower. DISTRIBUTION.—Mains, 1,000 ft.; cost extensions met by village funds. Meters, 0. FINANCIAL.—Cost, $5,000. Expenses, operating, $100. MANAGEMENT.—Ch. Pump. Engr., M. Mader. Rept. by R. Martan, Aug. 22, '96. SEWERS.—Has storm sewers.

F 8. **LANESBORO,** Fillmore Co. (898.) Built in '85-6 by village for fire protection. Supply, by gravity from impounding reservoir. Hydrants, 5. Operating expenses, $10. Prest., M. W. Williams; Treas., Ole Habberstad; Supt., C. H. De Villiers. Rept. by O. M. Habberstad, Secy. Fire Dept., July 22, '96.

P 9. **LE ROY,** Mower Co. (523.) Press rept., May, '96, stated $8,000 bonds for works had been voted by majority of 5. Aug, 8, '96, mayor rept. bonds not yet sold; also that general supply was to be pumped from well to tank.

39. **LESTER PRAIRIE,** McLeod Co. (189.) Built in '96 by village; put in operation in Nov. Engr., C. F. Loweth, St. Paul. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Driven wells, pumping to tank. PUMP.—Cap., 750,000 galls.; Fairbanks-Morse dup. Wood used as fuel. TANK.—Cap., 54,000 galls.; on 84-ft. wood tower. DISTRIBUTION.—Mains, 3,140 ft. Hydrants, 9. PRESSURE.—Ordinary, 45 lbs.; fire, direct. FINANCIAL.—Bids for $6,000 of 6% bonds were to be received June 22, '96; one bond payable yearly. SEWERS.—None.

40. **LE SUEUR,** Le Sueur Co. (1,763.) Built in '96 by city; put in operation in Oct. Engr., C. F. Loweth, St. Paul. Contr., C. H. Olsen, Stillwater. SUPPLY.—Artesian well, pumping to stand-pipe. PUMP.—Cap., 700,000 galls.; Goulds triplex, belted to electric light engine. Wood used as fuel. STAND-PIPE.—Cap., 132,000 galls.; steel, 18 × 75 ft. DISTRIBUTION.—Mains, 6,500 ft. Hydrants, 15. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. or more. FINANCIAL.—Cost, $25,000, including electric light plant. MANAGEMENT.—Rept. by Engr., latter part of '96. SEWERS.—None.

F 9. **LE SUEUR CENTER,** Le Sueur Co. (169.) Built in '96 by village. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. Supply, artesian well, pumping to tank. Pump, cap., 15,000 galls.; deep well, run by 5-HP. gasoline engine; from Contrs. Tank, cap., 31,000 galls.; wood, on steel tower 75 ft. high. Mains, ½ mile. Hydrants, public, 5. Pressure, 40 lbs. Cost, $5,000. Bonded debt, $2,000, at 6%. Prest., C. C. Kolars. Rept. by Contrs., Jan. 1, '97. Sewers, none.

41. **LITCHFIELD,** Meeker Co. (1,899.) Built in '89-90 by village. SUPPLY.—Driven well, pumping to stand-pipe. PUMPS.—Two Smith-Vaile dup. STAND-PIPE.—Cap., 67,000 galls. DISTRIBUTION.—Mains, 2.8 miles. Taps, 106. Hydrants, public, 22. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000. MANAGEMENT.—Rept. by Recorder, P. Rodange, Sept. 25, '96.

42. **LITTLE FALLS,** Morrison Co. (2,354.) Built in '90 by Little Falls Electric & Water Co. SUPPLY.—Mississippi River, pumping direct. PUMPS.—Cap., 1,000,000 galls.; Gordon (?) water-power. DISTRIBUTION.—Mains, 7 miles. Taps, 130. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. A. Berkey; Asst. Treas., T. C. Gordon; Supt., Russell Baker. Rept. by Asst. Treas., Sept. 22, '96.

43. **LONG PRAIRIE,** Todd Co. (Est., 1,079.) Built in '95 by village; put in operation in June. Engr., W. H. Garrett. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Open well, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; Laidlaw-Dunn-Gordon. Wood used; av. cost, $1 per cord. TANK.—Cap., 63,000 galls.; wood, on steel tower 60 ft. high. DISTRIBUTION.—Mains, 1.6 miles. Taps, 18. Services, galv. i.; paid for by property owner. Use of meters optional with consumer. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 20,000 (in summer). PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. One steam fire engine is used. FINANCIAL.—Cost, $9,500. Debt, $13,000: Floating, $3,000; Bonded, $10,000, at 6%. Sinking Fund, none. Expenses, Operating, $20. Deficits are met by taxation. MANAGEMENT.—Rept. by Jos. Deuhs, June 12, '96. SEWERS.—None.

44. **LUVERNE,** Rock Co. (1,466.) Built in '92 by village. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Gordon (rept. by makers). FINANCIAL.—Cost, $30,000. NOTE.—Unsigned rept. Aug., '96.

—? **LYLE,** Mower Co. (306.) Built in '95 by village. Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Well, 100 ft. deep, pumping to tank. PUMP.—Driven by windmill on top of tank. TANK.—Wood, 24 ft. diam., covered, on steel tower. FINANCIAL.—Bids for $5,000 of 6% bonds were to be received Oct. 12, '94; $500 payable yearly. REFERENCE.—Steel tower, Eng. News, Feb. 13, '96, illus.

P 10. **MABEL,** Fillmore Co. (278.) Village hopes to build in '97. Engr., F. H. Pickles, Winona. Supply, deep well, pumping to reservoir. Est. cost, $5,000. Latest rept. from H. E. Wheeler, Dec. 17, '96. Press rept. stated $5,000 bonds were sold in May, '96.

45. **MADELIA,** Watonwan Co. (852.) Built in '91 by village; put in operation Dec. 1. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 20,000 galls.; single acting deep well. Hocking Valley bituminous coal used; av. cost, $4.85 per short ton. TANK.—Cap., 80,000 galls.; pine, 26 × 20 ft. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions

met by taxation. Taps, 70; made by village for $3. Services, galv. i.; paid for by consumer. Meters: 13; owned by consumer; controlled by village. Use of meters optional with consumer. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 2,500. PRESSURE.—Ordinary and fire, 43 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $9,000, at 5%, due in 1911. Expenses, $1,150: Operating, $700; int., $450. Revenue, $722: Consumers, unmetered, $525; metered, $45; City, fire protection, $62; public buildings, $90. MANAGEMENT.—Prest., F. C. Gleason; Secy., S. Larson; Supt. and Ch. Pump. Engr., W. R. Smith. Rept. by Secy. and Supt., Dec. 14, '96. SEWERS.—None.

46. **MANKATO,** Blue Earth Co. (8,838.) Built in '88-9 by city; fire protection works built in '79, also by city. SUPPLY.—Two artesian wells, 650 ft. deep, pumping to distributing reservoir. PUMPS.—Cap., 3,000,000 galls.: 1,500,000 Holly-Gaskill hor. high duty, 1,500,000 Knowles low duty. Iowa and Illinois bituminous coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 870,000 galls.; one-half mile from pumping station and 223 ft. above it. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 11.4 miles; cost extensions met by frontage tax of 10c. per ft. and by general fund. Taps, 685; made by city, no fee. Services, lead; paid for by consumer. Meters: 20; owned, controlled and repairs paid by city; yearly rental, none. Use of meters compulsory for largest consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 111. CONSUMPTION.—(Galls.) av., 956,000; max., 1,200,000; min., 800,000. PRESSURE.—Ordinary and fire, 92 lbs. FINANCIAL.—Cost, $97,670. Bonded debt, $87,000, at 5, 6 and 7½%. Expenses, $17,194: Operating, $4,874; repairs, $1,664; int., $4,845; profit and loss, $5,781. Revenue, $17,164: Consumers, $8,537; frontage tax, $3,242; City, fire protection, $3,885; street sprinkling, est., $1,500. MANAGEMENT.—Bd. of Pub. Wks.; Prest., S. W. Burgess; City Treas., C. P. Williams; Ch. Pump. Engr., Chas. Koke. Rept. by City Engr., M. B. Haynes, June 5, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 13, '81.

47. **MAPLETON,** Blue Earth Co. (607.) Built in '89 by village; put in operation in July; Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 25,000 galls.; Eclipse double-acting, run by 7-HP. Fairbanks-Morse gasoline engine. TANK.—Cap., 56,000 galls.; wood, on wood tower 80 ft. high. DISTRIBUTION.—Mains, 1¼ mile. Services, w. i.; paid for by owner. Hydrants, public, 8. PRESSURE.—Ordinary, 20 lbs. FINANCIAL.—Cost, $8,500. No debt. MANAGEMENT.—Prest. Vill. Council, W. A. Hanna. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

48. **MARSHALL,** Lyon Co. (1,203.) Built in '94 by village; put in operation in Dec. Engr., C. L. Pillsbury. Contr., E. T. Sykes, Minneapolis. SUPPLY.—Artesian wells, pumping to tank. PUMP.—Cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon. Hocking Valley bituminous coal used; av. cost, $5.13 per short ton. RESERVOIR.—Cap., 90,000 galls.; storage. TANK.—Cap., 60,000 galls.; wood, on iron tower 114 ft. high. FISCAL YEAR CLOSED in Dec. DISTRIBUTION.—Mains, 3 miles; cost extensions met by special tax. Taps, 90; made by village for $2 each. Services, lead and iron; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants,, public, 23. CONSUMPTION.—(Galls.) av., 95,000; max., 100,000; min., 6,000. PRESSURE.—Ordinary, 41 to 45 lbs.; fire, 100 lbs. Steam fire engines are sometimes used. FINANCIAL.—Debt, $19,500: Floating, $2,500, at 7%; Bonded, $17,000, at 6%, due in 20 yrs. Expenses, $1,530: Operating, $500; int., $1,020; taxes, $10. Revenue, $360: Consumers, unmetered, $170; street sprinkling, $100; public buildings, $90. Works are run in connection with electric light plant. MANAGEMENT.—Prest., C. C. Chittenden; Secy., J. C. Burchard; Ch. Pump. Engr., W. L. Garrett. Rept. by Supt., J. R. McGee, Oct. 21, '96. SEWERS.—Has storm sewers only.

49. **MAZEPPA,** Wabasha Co. (Est., 464.) Built in '91 by village; put in operation in May. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, pumping to tank. PUMP.—Deep well, run by 16-ft. wind-mill. TANK.—Cap., 56,000 galls.; wood, on wood tower 70 ft. high. DISTRIBUTION.—Mains, ¼ mile. Services, w. i.; paid for by owner. Hydrants, public, 3. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $4,000. MANAGEMENT.—Council. Recorder, W. A. Munger. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

F 10, P 11. **MILACA,** Millelacs Co. (404.) Built by village. Water is supplied by the Foley Bros. Lumber Co.'s planing mill. Hydrants, public, 3. Steam fire engines are used. Cost, $2,000. Prest., A. C. Wilkes. Rept. by J. M. Bolland, Dec., '96.

PROJECTED WORKS.

Town expects to build works. Supply, by pumping. Rept. July, '96. Press rept., Sept. 26, '96, stated town had voted bonds.

50. **MINNEAPOLIS,** Hennepin Co. (164,738.) Built in '67 by city. SUPPLY.—Mississippi River, pumping direct. PUMP.—Cap., 70,000,000 galls.; about 40,000,000 water power, and 2—15,000,000 Worthington hor. comp. high-duty. Youghiogheny bituminous coal used; av. cost, $3.43 to $4.25 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 229 miles; cost extensions met by assessments of property benefited and by general fund. Taps, 14,349; made by city, ordinarily for $4. Services, lead; paid for by consumer. Meters: 2,300; owned and repairs paid by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 2,786; private, 40. CONSUMPTION.—(Galls.) av., 17,-

401,000; max., 23,076,847; min., 14,412,176. PRESSURE.—Ordinary, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,365,915. Bonded debt, $1,230,000, at 4.37% average. Expenses: Operating, $99,809. Revenue: Consumers, $211,590. No deficits. MANAGEMENT.—Supervisor, J. H. McConnell; Ch. Pump. Engr., Andrew Bergstrom. Rept. by Registrar, F. T. Moody, June 6, '96. PROJECTED IMPROVEMENTS.—Large reservoir under construction, cost $1,200,000, and filter plant projected; Cy. Engr., F. W. Cappelen. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 29, '81; storage reservoir and proposed filtration plant, Aug. 30, '94.

—? **MINNESOTA LAKE,** Faribault Co. (340.) Built in '94 by village. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Pumping to tank. PUMP.—Driven by 16-ft. Halladay windmill. TANK.—Cap., 60,000 galls.; on 80-ft. wood tower. FINANCIAL.—Contract price, $4,500.

51. **MONTEVIDEO,** Chippewa Co. (1,437.) Built in '92 by village. Supply, well and river, pumping to tank. PUMP.—In '92 there was a pump in a mill and another one driven by windmill. Feb., '96, bids were to be received for power pump and gasoline engine. MANAGEMENT.—(Feb., '96.) Prest. Council, M. E. Titus. TANK.—Cap., 90,000 galls.; on hill 135 ft. above First St.

52. **MONTGOMERY,** Le Sueur Co. (1,086.) Rept. as having complete works.

53. **MOORHEAD,** Clay Co. (2,088.) Built in '81 by village. Improvements were made in '96. SUPPLY.—Red River of the North, pumping direct. PUMPS.—Aggregate of 4,000,000 (?) galls. Blake rept. in '90. Makers rept. 1,000,000 Worthington 6-cylinder triple exp. DISTRIBUTION.—(In '90.) Mains, 4 miles. Taps, 60. Hydrants, 55. FINANCIAL.—(In '90.) Cost, $45,000. Bonded debt, $30,000, at 8%. Expenses, $6,035: Operating, $3,635; int., $2,400. Revenue: Consumers, $2,000. NOTE.—No rept. since '90-1 Manual.

—? **MOUNTAIN IRON,** (P. O. Mount Iron), Saint Louis Co. (Est., 443.) Built in '94 by Co.; put in operation Aug. 1. Engr., Duncan Wheeler, Duluth. FRANCHISE.—20 yrs. from '94. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $150 per hydrant per yr. LEGAL DIFFICULTIES.—City refused to pay hydrant rental on ground that pressure was insufficient and was not maintained at all times; Co. sued for settlement and court awarded verdict to city. Franchise was lost and plant has been abandoned, the Co. not being able to appeal from the decision of the court. SUPPLY.—Springs, by pumping. PUMP.—Cap., 500,000 galls.; Fairbanks-Morse. RESERVOIR.—Cap., 75,600 galls.; storage. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by property owners. Taps, 14; made by consumer. Use of meters optional with consumer. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 125,000; max., 150,000; min., 75,000. PRESSURE.—Ordinary, 30 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $8,750. Cap. Stock: Authorized, $25,000; paid-up, $5,000. Bonded debt, $3,000, at 10%. Expenses: Operating, $1,200; taxes, $130. Revenue, $2,100: City, fire protection, $1,800; other purposes, $300. MANAGEMENT.—Prest., A. R. Merritt, West Duluth; Secy., J. Jumer. Rept. by Prest., June 15, '96.

—? **NEW PRAGUE,** Scott Co. (955.) Built in '95 by village; put in operation Jan., '96. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—8-in. artesian well, pumping to tank. PUMP.—Deep well, run by 10-HP. Fairbanks-Morse gasoline engine. TANK.—Cap., 61,000 galls.; wood, on steel tower, 80 ft. high. DISTRIBUTION.—Mains, ⅔ mile. Hydrants, public, 10. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—Cost, $8,500. Debt: Floating, $8,000, at 8%; Bonded, none. MANAGEMENT.—Prest., M. Schreiner; Cy. Clk., Jno. Joach. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

54. **NEW ULM,** Brown Co. (3,741.) Built in '89-90 by city; put in operation in Nov. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Well, pumping to reservoir, thence pumping to tank. PUMP.—Cap., 150,000 galls.; deep well. RESERVOIR.—Cap., 45,000 galls. TANK.—Cap., 26,000 galls.; on 104-ft. tower. FISCAL YEAR CLOSED March 31, '96. DISTRIBUTION.—Mains, 5 miles. Taps, 182. Meters, 113. Hydrants, public, 47. CONSUMPTION.—(Galls.) av., 32,300. FINANCIAL.—Cost, $41,551. Bonded debt, $10,000, at 6%; due 1900. Expenses: Operating, $2,918. Revenue, $2,166: Consumers, $1,678; street sprinkling, $410; other purposes, $77. NOTE.—Rept. by Louis Schilling, Sept. 23, '96.

55. **NICOLLET,** Nicollet Co. (263.) Built in '93 by village; put in operation in Aug. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Artesian well, pumping to tank. PUMPS.—Deep well, run by 16-ft. Challenge windmill. TANK.—Cap., 56,000 galls.; wood, on wood tower 80-ft. high. DISTRIBUTION.—Mains, ½ mile; cost extensions met by village. Services, w. i. Hydrants, public, 6. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, about, $6,000. No debt. Expenses: Operating, $90. Rept. by Contrs., Jan. 1, and by Ed. H. Olson, Jan. 14, '97. SEWERS.—None.

56. **NORTHFIELD,** Rice Co. (2,659.) Built in '94-5 by city; put in operation Feb. 1, '95. Engr., C. F. Loweth, St. Paul. Contrs., Million & Young, St. Paul. SUPPLY.—Artesian well, flowing 1,500,000 galls., daily pumping to tank and direct. PUMP.—Cap., 1,000,000 galls.; Gordon comp. dup. TANK.—Cap., 240,000 galls.; steel; 35 × 35 ft., on stone foundation on hill 190 ft. above pumping station. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 6.4 miles. Taps, 100; made by city for $1. Services, lead;

paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 67. CONSUMPTION.—(Galls.) av., 52,677. PRESSURE.—Ordinary, 87 lbs.; fire, direct pressure. FINANCIAL.—Cost, $41,005. Bonded debt, $40,000, at 5%. Expenses, $3,606: Operating, $1,606; int., $2,000. Revenue: Consumers, $1,313. Deficits are all met by taxation. MANAGEMENT.—Prest., C. W. Blodgett. Rept. by Secy. and Supt., C. W. Streeter, June, '96. SEWERS.—Has partial system of sanitary sewers.

57. **NORTH SAINT PAUL,** Ramsey Co. (1,099.) Built in '89 by North St. Paul Water Co. SUPPLY.—Artesian well for domestic use; Silver Lake for fire protection; pumping direct from lake and reservoir and pumping to stand-pipe. PUMPS.—Cap., 1,150,000 galls.; Smith & Valle artesian; two Blake, one a dup. STAND-PIPE.—Cap., 51,000 galls.; 16 × 84 ft. DISTRIBUTION.—Mains, 2.3 miles. Hydrants, 20. FINANCIAL.—Withheld. NOTE.—No rept. since '90-1 Manual.

58. **OWATONNA,** Steele Co. (3,849.) Built in '90 by city. Enlarged since '91; Des. Engr., C. F. Loweth, St. Paul. SUPPLY.—An artesian and an open well and a filter gallery connecting with latter, pumping to stand-pipe. PUMPS.—Cap., 2,125,000 galls.: 1,000,000 Smedley; 1,125,000 Smith-Valle comp. dup. Wilmington coal used; av. cost, $3.55 per short ton at station. STAND-PIPE.—Cap., 150,400 galls.; iron; 16 × 100 ft. FISCAL YEAR CLOSED Mar. 15. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general tax. Taps, 300; made by city for $1.50. Services, iron; paid for by property owner. Meters: 14; owned by city or consumer. yearly rental, none. Use of meters compulsory for breweries. City can compel use of meters and any consumer may have one. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., $205,480; max., 300,000; min., 140,000. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $46,453. Bonded debt, $30,000, at 5%; due in 1921. Sinking Fund, none. Expenses: Operating, $3,104; int., $2,323. Revenue, $6,276: Consumers, $4,101; City, fire protection, $2,000; sewer flushing, $50; public buildings, $25; other purposes, $100. MANAGEMENT.—Ch. Pump. Engr., S. Sorseilier. Rept. by Supt., S. S. Green, June 4, '96. SEWERS.—Has sanitary sewers only.

59. **PARK RAPIDS,** Hubbard Co. (Est., 820.) Built in '93 by village. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Fishhook River, pumping direct. PUMP.—Crane & Ordway triplex. DISTRIBUTION.—Mains, 1 mile; cost extensions met by village. Services, galv. i.; paid for by property owner. Village cannot compel and may prohibit use of meters. Hydrants, public, 9. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Bonded debt, $6,000, at 6%. MANAGEMENT.—Rept. by Supt., F. M. Shepard, Dec. 16, '96. SEWERS.—None.

—? **PIERZ,** Morrison Co. (Township, 1,337.) Makers rept. 8 × 8-in. Goulds pump driven by a gasoline engine.

60. **PIPE STONE,** Pipe Stone Co. (1,282.) Built in '88 by village. SUPPLY.—Two drilled wells, pumping to stand-pipe and direct. PUMPS.—Two steam. STAND-PIPE.—Cap., 90,000 galls.; 12½ × 100 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 200. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 43 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $20,000, at 6%. Expenses, $3,000: Operating, $1,800; int., $1,200. Revenue, Consumers, $2,000. MANAGEMENT.—Supt., John Ross. Rept. by Comrs., Reader Bros., Sept. 24, '96.

61. **PLAINVIEW,** Wabasha Co. (Est., 864.) Built in '95-6 by village; put in operation Jan. 20. Engrs. & Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Drilled well, 329 ft. deep, pumping to tank. PUMPS.—Deep well, run by 10 HP. Fairbanks, Morse & Co. gasoline engine. TANK.—Cap., 67,000 galls.; wood, 25 × 20 ft., on steel tower 80 ft. high. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by public funds. Taps, 100; made by consumer. Services, galv. i.; paid for by consumer. Meters: 10; owned by consumer. Village can compel use of meters and any consumer may have one; compulsory for hotels and steam boilers. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 6,300. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $17,000. Debt, $11,500: Floating, $1,500, at 6%; Bonded, $10,000, at 5%; due 1905. Expenses, Operating, $300; int., $500. Revenue, Consumers, $600. MANAGEMENT.—Secy., Jas. A. Carley; Supt. and Ch. Pump. Engr., P. J. Freisheim. Rept. by Prest., T. G. Bolton, Aug. 26, '96. SEWERS.—None.

62. **PRESTON,** Fillmore Co. (Est., 1,316.) Under construction in '96 by village. Engrs., Iowa Engineering Co., Clinton, Ia. Contrs., Dubuque Construction Co. SUPPLY.—Large spring, pumping to storage reservoir. PUMP.—Cap., 750,000 galls.; Buffalo dup. underwriters'. RESERVOIR.—Cap., 200,000 galls.; storage, 200 ft. above and 2,100 ft. from pump. DISTRIBUTION.—Mains, 1¾ miles. Taps, 50 (contracted for). Services, galv. i.; paid for by consumer. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 25. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, est., $13,000. Bonded debt, $18,000, at 6%; due $1,000 in 5 yrs. and $1,000 each year thereafter for 13 yrs., then $2,000 yearly until paid. MANAGEMENT.—Mayor, M. R. Todd; Recorder, Julius Johnson; Treas., Carl Kuthe. Rept by Supt., C. M. Morgan, June 16, '96. SEWERS.—None.

63. **RED WING,** Goodhue Co. (6,294.) Built in '84 by city. SUPPLY.—Mississippi River (main channel), pumping to reservoir. PUMPS.—Cap., 3,250,000 galls.; Blake dup.

non-cond. A 2,000,000 Snow vert. comp. cond. pump was to be in operation Oct. 1, '96. Av. cost of coal, $3.25 to $3.30 per short ton. RESERVOIR.—Cap., 1,000,000 galls.; 265 ft. above pumps and one mile distant. DISTRIBUTION.—Mains, cost extensions met by city appropriations. Taps, 291. Services, galv. i.; paid for by consumer. Meters: 84; owned by city and consumers. Hydrants, public, 77. CONSUMPTION.—(Galls.) av., 173,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $100,000. Expenses, Operating, $4,427. Revenue, $5,304. MANAGEMENT.—Prest., Wm. Robson; Secy., S. J. Willard; Treas., N. K. Simmons; Supt., W. I. Miller; Ch. Pump. Engr., O. A. Fisher. SEWERS.—Has partial sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 6, '84.

64. **REDWOOD FALLS,** Redwood Co. (1,238.) Built in '92 by city. Engr., C. F. Loweth, St. Paul. Contrs., H. H. Harrison & Co., Stillwater. SUPPLY.—Springs, pumping to tank; connection with Redwood River for fire purposes. PUMPS.—Cap., 1,000,000 galls.; Gordon. TANK.—Cap., 90,000 galls., on tower 84 ft. high. DISTRIBUTION.—Mains, 3 miles; cost extensions met by assessments. Taps, 50; made by city. Services, iron or lead; paid for by property owner. Meters: 5; owned and controlled by city. Use of meters optional with consumer; compulsory for hotels, livery, etc. Hydrants, public, 35. PRESSURE.—Ordinary, 44 lbs.; fire, 80 lbs. FINANCIAL.—Cost, about $25,000. Expenses: Operating, $500; int., $1,200. MANAGEMENT.—Rept. by Mayor, W. F. Dickinson, Sept. 24, '96. SEWERS.—Has sanitary sewers only ("small amount").

65. **RENVILLE,** Renville Co. (413.) Built in '92 by city; put in operation in Oct. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Surface well, pumping to tank and direct. PUMP.—Cap., 700,000 galls.; Smith-Vaile dup. Iowa bituminous coal used; av. cost, $2.80 per short ton, delivered. TANK.—Cap., 56,000 galls.; wood, on wood tower 90 ft. high. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by tax levy. Taps, 16; made by consumer. Meters, 0. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 1,800; max., 2,800; min., 1,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $13,000. Expenses, Operating, $700. Deficits are met by general taxation. MANAGEMENT.—Village Council: Prest., G. S. Humphrey; Secy., F. H. Berning. Rept. by Contrs., Jan. 1, '97, and by Prest. SEWERS.—Has storm sewers only.

F 11. **RICHMOND,** Winona Co. (Township, 252.) There is an elevated tank for fire protection, but no mains.

66. **ROCHESTER,** Olmsted Co. (5,321.) Built in '87 by Rochester Water-Works Co. Press repts. state B. W. Eaton, of Rochester, was appointed receiver in July, on application Farmers' Loan & Trust Co., N. Y. City, Trustees for first and second mortgage bondholders; also that court ordered plant sold in Dec., '96, unless indebtedness was paid at once. FRANCHISE.—30 yrs. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.: 2—1,250,000 Worthington comp. cond. (rept. by makers in '96). STAND-PIPE.—Cap., 225,000 galls.; 25 × 62 ft. DISTRIBUTION.—(In '88.) Mains, 10 miles. Taps, 150. Meters, 23. Hydrants, 139. PRESSURE.—(In '88.) Ordinary, 79 lbs.; fire, 150 lbs. FINANCIAL.—(In '88.) Cost, $150,000. Bonded debt, $115,000, at 6% (rept. in '96 as $200,000). Expenses: Operating, $2,000. Revenue, $9,136: Consumers, $4,600; City, $4,536. NOTE.—No rept. since '90-1 Manual.

67. **ROLLING STONE,** Winona Co. (Township, 923.) Built in '94 by village; put in operation Nov. 15. Engr., Fred H. Pickles, Winona. Contr., N. Arnoldy. SUPPLY.—A 6-in. well, pumping to tank. PUMP.—Driven by 16-ft. windmill. TANK.—Cap., 56,000 galls.; wood, on 80-ft. tower. DISTRIBUTION.—Mains, 1,008 ft. Taps, 6; made by village. Meters, 0. Hydrants, public, 5. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $45,000. Floating debt, none. Expenses: Operating, $35. MANAGEMENT.—Prest., Michael Schneider; Secy., Jno. Kohner; Treas., John Jung.

68. **RUSHFORD,** Fillmore Co. (968.) Built in '94-5 by city; put in operation Aug. 1. Engr., O. H. Case, Fountain. Contr., A. V. Fetter, La Crosse, Wis. SUPPLY.—Well, flowing into collecting reservoir, thence pumping direct. PUMP.—Cap., 96,000 galls.; Hooker. Wilmington, lump coal used; av. cost, $3.50 per short ton delivered. RESERVOIR.—Cap., 190,000 galls. FISCAL YEAR CLOSED Apr. 6. DISTRIBUTION.—Mains, 2 miles; cost extensions met by appropriations from general fund. Taps, 25; made by consumer, no fee to city. Services, galv. i.; paid for by consumer. Meters: 0; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 21. CONSUMPTION.—(Galls.) av., 7,500; max., 10,000; min., 5,000. PRESSURE.—Ordinary, 65 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $14,000. MANAGEMENT.—Rept. by Cy. Clk., W. F. Drake, June 15, '96. SEWERS.—None.

69. **SAINT CHARLES,** Winona Co. (1,178.) Built in '95 by city; put in operation Nov. 26. Engr., Fred. H. Pickles; Contr., T. J. Green; both of Winona. SUPPLY.—Artesian well, pumping to reservoir. PUMP.—Cap., 250,000 galls.; Laidlaw-Dunn-Gordon deep well. Illinois bituminous coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., 630,000 galls.; storage. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 3 miles; cost extensions met by city. Taps, 50; made by city for $1. Services, galv. i. and lead. Meters, 1; owned by consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 30,000. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $21,000. Debt, $17,000: Floating, $1,000, at 6%; Bonded,

$16,000, at 5%. Expenses: Operating, $1,000. Revenue: Street sprinkling, $400. MANAGEMENT.—Rept. by Supt., E. C. Dow, Aug. 14, '96. SEWERS.—None.

70. **SAINT CLOUD,** Stearns Co. (7,696.) Plant now in hands of a receiver. Press rept., Feb., '97, stated bondholders had begun foreclosure proceedings on $130,000 mortgage. Built in '83 by city. Bought in '87 by St. Cloud Water-Works Co., and greatly extended in '88. SUPPLY.—Mississippi River, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2,000,000 Deane, and 2—500,000 Gaskill. STAND-PIPE.—Cap., 350,000 galls.; 25 x 100 ft. DISTRIBUTION.—Mains, 12.7 miles. Taps, 350. Hydrants, public, 143. FINANCIAL.—Cost (in '87), $175,000. MANAGEMENT.—Secy., J. A. Chase. Rept. by Receiver, C. S. Benson, Nov. 28, '96.

71. **SAINT JAMES,** Watonwan Co. (989.) Built in '95 by city; put in operation Aug. 15. Engr., C. F. Loweth, St. Paul. Contr., E. T. Sykes, Minneapolis. Operated in connection with commercial and street lighting plant. SUPPLY.—Two wells, artesian and surface, pumping to stand-pipe and direct. PUMPS.—Gordon; a deep well, for pumping to stand-pipe, and a 1,000,000 fire pump. Iowa bituminous coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 209,000 galls.; steel; 18 x 110 ft. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by village. Taps, 100; made by village. Services, galv. t.; paid for by consumer. Meters: 2; owned by consumer; controlled by city; repaired by city. Use of meters compulsory for hotels and mill. Village can compel use of meters and any consumer may have one. Hydrants, public, 82. CONSUMPTION.—(Galls.) av., 2,500. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $22,000. Bonded debt, $20,000, at 6%; due in 18 yrs. Sinking Fund, none. Deficits are met by license and a small special tax each year. MANAGEMENT.—Secy., Wm. Roberts; Ch. Pump. Engr., H. Zimmerman. Rept. by Prest., C. Ellsworth, Aug. 27, '96. SEWERS.—Has 1½ miles of sanitary sewers.

72. **SAINT PAUL,** Ramsey Co. (133,156.) Owned since '82 by city; built in '70 by St. Paul Water Co. SUPPLY.—Phalen, Vadnais, Pleasant and others of chain of lakes, and artesian wells, by gravity (evidently some of the water is pumped to gravity conduit.—Ed.) and by direct pumping for high service. Lakes are 5 to 18 miles from city and have a drainage area of about 150 sq. mi. PUMPS.—Cap., 12,000,000(?) galls.; three Allis. (Evidently these are at high service station, 2—3,000,000 and one 6,000,000 Allis, the latter a vert, triple exp. Makers also rept. a 15,000,000 vert. comp. and a 5,000,000 hor. tandem comp. Ch. Pump. Engr.'s rept. for '95 refers to three stations, besides high service, apparently in drainage area.) Youghiogheny bituminous coal used; av. cost, $4 per short ton. RESERVOIR.—Cap., 18,000,000 galls.; for high service. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 233.7 miles; cost extensions met by bonds and revenue. Taps, 14,242; made by city, including service, at consumer's expense. Services, ¾-in. lead; paid for by consumer. Meters: 1,520; owned, 1,474 by city; 46 by consumers; controlled by city; repairs paid by one at fault. Use of meters compulsory for R. Rs., hotels, restaurants and large dwellings. City can compel use of meters and any consumer may have one. Hydrants, public, 2,225; private, 10. CONSUMPTION.—(Galls.) av., 8,250,000; max., 12,000,000; min., 7,000,000. PRESSURE.—Ordinary, 80 to 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,579,976. Bonded debt, $2,460,000: $450,000, at 4%; $1,150,000 at 5%; $860 000, at 4½%. Sinking Fund, Dec. 1, '95: $336,910.67, amounts now to $363,000, invested in St. Paul certificates at 4%. Expenses: Operating, $43,547; int., $114,200. Revenue, $253,126: Consumers, unmetered, $119,492.36; metered, $59,754.16; City, fire protection, $60,000; street sprinkling, $13,476.50; sewer flushing, $403. MANAGEMENT.—Prest., Robt. B. C. Bement; Secy., John Caulfield; Supt., A. R. Starkey; Ch. Pump. Engr., Martin Feist. Rept. by Secy., Oct. 30, '96. PROJECTED IMPROVEMENTS.—About $150,000 will be spent on improvements. A large surplus is annually expended for extensions. SEWERS.—Has sewers. REFERENCE.—Eng. News, May 6, '82.

73. **SAINT PETER,** Nicollet Co. (3,671.) Built in '88-9 by city. SUPPLY.—Well near river, pumping to stand-pipe. PUMPS.—Cap., 1,750,000 galls.; Smedley. STAND-PIPE.—Cap., 151,000 galls.; 20 x 60 ft. DISTRIBUTION.—(In '90.) Mains, 8 miles. Taps, 40. Meters, 1. Hydrants, 35. PRESSURE.—(In '88.) Ordinary, 85 lbs.; fire, 110 lbs. FINANCIAL.—(In '90.) Cost, $38,000. Bonded debt, $12,000, at 6%. Expenses, $2,620: Operating, $700; int., $1,920. Revenue: Consumers, $300. NOTE.—No rept. since '90-1 Manual.

74, 74½. **SANDSTONE,** Pine Co. (517.)

SANDSTONE SUPPLY CO.

Built in '95; put in operation in Aug. or Sept. Engr., E. T. Abbott, Minneapolis. Contrs., Fairbanks, Morse & Co., St. Paul. FRANCHISE.—30 yrs. from '95. Rates are subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Artesian well, 8 ins. x 170 ft., and spring running from sandstone ledge, pumping to tanks. PUMP.—Cap., 500,000 galls.; water power. TANKS.—Cap., 100,000 galls.; two 500,000, pine; one 22 x 18 ft., on wooden tower 70 ft. high; 250 ft. above pump. DISTRIBUTION.—Mains, 3 miles; cost extensions met by income. Taps, 120; made by Co. for $10, including service to 8 ft. inside property line. Services, w. i. or galv. t.; paid for by property owner. Meters, 0. Use of meters optional with Co. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 50,000; max., 100,000; min., 40,000. PRESSURE.—Ordi-

nary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost (rept. by F., M. & Co.), $10,000. Cap. Stock: Common, authorized, $25,000; all paid-up. Debt: Floating, none; Bonded, $10,000, at 6%; due in 1905. Expenses, $1,220: Operating, $620; int., $600. Revenue, $3,100: Consumers, unmetered, $2,400; City, fire protection, $700. MANAGEMENT.—Prest., Geo. W. Bester, Minneapolis, Minn.; Ch. Pump. Engr., E. F. Stuart. Rept. by Contrs., Jan. 1; by Co., Jan. 11, and by Ch. Pump. Engr., Jan. 18, '97. SEWERS.—None.

VILLAGE PLANT.

Bought by village Sept., '93; built in '88 by W. H. Grant, and afterward owned by Sandstone Water Co. SUPPLY.—Springs, impounded by dam, pumping to reservoir. DISTRIBUTION.—Mains, 2.2 miles. Hydrants, 7. FINANCIAL.—Cost, $15,000. NOTE.—No rept. since '90-1 Manual, except regarding change in ownership.

75. **SAUK CENTRE,** Stearns Co. (1,695.) Owned by city since '88; built in '84 by Co. Co. and town were in litigation for some time. SUPPLY.—Sauk Lake, pumping direct from well 50 ft. from lake. PUMP.—Cap., 1,750,000 galls.: 500,000 Fairbanks-Morse; 1,250,000 Worthington dup. water power. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 1¾ miles; cost extensions met by water-works tax. Taps, 150; made by consumer. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 600,500. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $16,500. Bonded debt, $12,000; due in 10 yrs. Expenses, $2,020: Operating, $2,000; int., $20. Revenue, City, fire protection, $1,650. MANAGEMENT.—City Treas., L. Kolls. Rept. by Supt., L. E. Coe, June 6, '96. SEWERS.—None.

76. **SHERBURNE,** Martin Co. (316.) Built in '95 by city. Engr., C. F. Loweth, St. Paul. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 200,000 galls.; deep-well, geared to 11-HP. Otto gasoline engine. TANK.—Cap., 72,000 galls.; on 70-ft. steel tower. DISTRIBUTION.—Mains, 1 mile. Hydrants, 11. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, about, $11,000. MANAGEMENT.—Rept. by Engr. in '96. SEWERS.—None.

F 12. **SLEEPY EYE,** Brown Co. (1,513.) Built in '95 by city for fire protection. Supply, well, pumping to reservoir.

F 13. **SPRINGFIELD,** Brown Co. (716.) Built in '94 by town for fire protection; may be extended for domestic service later. Pump, cap., 1,000,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). Recorder, Geo. Gorman.

77. **SPRING GROVE,** Houston Co. (394.) Built by village; put in operation Mar. 15, '96. Engrs. and Contrs., Challenge Wind Mill & Feed Mill Co., Batavia, Ill. SUPPLY.—Artesian well, pumping to tank. PUMP.—Cap., 19,000 galls.; run by 6-HP. Davis gasoline engine. TANK.—Cap., 50,000 galls.; wood, 20 × 22 ft., on steel trestle 60 ft. high. FISCAL YEAR CLOSED Mar. 6. DISTRIBUTION.—Mains, ¼ mile. Taps, 2. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with village. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 800. PRESSURE.—Ordinary, 37 lbs. FINANCIAL.—Cost, $5,000. Debt, $4,000: Floating, $1,000, at 6%. Bonded, $3,000, at 6%; due in 1915. Deficits are met entirely by taxation. MANAGEMENT.—Prest., A. Halverson; Treas., O. N. Hendrickson; Ch. Pump. Engr., L. Berdahl. Rept. by Secy., S. H. Ellestad, July 1, '96. SEWERS.—None.

78. **SPRING VALLEY,** Fillmore Co. (1,381.) Built in '92 by city. Engr. and Contr., Jas. A. Trane, La Crosse, Wis. SUPPLY.—Two springs, one 60 ft. in diam., water 10 ft. deep, pumping direct. PUMPS.—Two Gordon. Bituminous coal used; av. cost, $2.80 per short ton. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by city. Taps, 100; made by city for $2. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 50. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $15,000. Debt, $14,500: Floating, $2,500, at 6%; Bonded, $12,000, at 6%; due in 1910. Expenses: Operating $2,500. Revenue: Consumers, $1,000. MANAGEMENT.—Prest., B. F. Fanner; Secy., H. E. Leach. SEWERS.—None.

79. **STEWARTVILLE,** Olmstead Co. (Est., 430.) Built in '95 by village; put in operation Nov. 23. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY. 8-in. drilled well, 63 ft. deep, pumping to tank. PUMP.—Cap., 50,000 galls.; Fairbanks-Morse. TANK.—Cap., 67,000 galls.; 24 × 20 ft., on wood substructure 8 ft. high. DISTRIBUTION.—Mains, ½ mile. Taps, 11; made by village. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 2,000; max., 6,000; min., 100. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $6,000. MANAGEMENT.—Secy., J. J. Kelley. Rept. by Supt. and Pump. Engr., J. O. Dicken, Aug. 7, '96. SEWERS.—None.

80. **STILLWATER,** Washington Co. (11,260.) Built in '80 by Stillwater Water Co. FRANCHISE.—30 yrs. SUPPLY.—McKusick's Lake, by gravity for low, and pumping to tanks and stand-pipe for high service. Lake about one mile from and 150 ft. above city; area, 55 acres; depth, 6 to 10 ft.; drainage area, about 6 sq. miles. PUMP.—Cap., 3,000,000 galls.; 2—1,000,000 Blake, and 1,000,000, make not given. FILTERS.—(In '89.) Area, 5,000 sq. ft.; gravel and charcoal on plank rack. Clear water reservoir, 100 × 200 ft., × 10 ft. deep. STAND-PIPE.—Cap., 85,000 galls.; steel; 15

× 65 ft. TANKS.—Cap., 200,000 galls.; two 30 × 20 ft. DISTRIBUTION.—Mains, 10 miles. Taps, 600. Hydrants, public, 126. CONSUMPTION.—(Galls.) av., 1,000,000. FINANCIAL.—(In '90.) Cost, $215,000. Bonded debt, $100,000, at 7%. Expenses, $10,450: Operating, $3,450; int., $7,000. Revenue, $16,750: Consumers, $9,500; City, fire protection, $7,250. MANAGEMENT.—Prest., E. W. Durant; Treas., R. S. Davis. Rept. by Secy. and Supt., H. H. Harrison, Nov. 12, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Oct. 15, '81.

81. **TRACY**, Lyon Co. (1,400.) Built in '92 by city; put in operation in Dec. Engr., C. F. Loweth, St. Paul. Contrs., Fairbanks, Morse & Co., St. Paul. Built in connection with street and commercial lighting plant. SUPPLY.—Deep well, pumping to receiving reservoir, repumping to tank. PUMPS.—Cap., 1,000,000 galls.; a 1,000,000 dup. fire and a deep well, both Smith-Vaile. Av. cost of coal used, $4 to $5 per short ton. RESERVOIR.—Cap., 100,000 galls. TANK.—Cap., 94,000 galls.; wood; on 84-ft. wood tower. DISTRIBUTION.—Mains, 3 miles; cost extensions met by general fund. Taps, 125; made by consumer, no fee. Services, ¾-galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 29. CONSUMPTION.—(Galls.) av., 9,450. PRESSURE.—Ordinary, 43 lbs.; fire, 125 lbs. FINANCIAL.—Original cost of combined plants, $42,000. SEWERS.—Storm sewers are in process of construction.

82. **TWO HARBORS**, Lake Co. (Est., 1,934.) Built in '89 by village. SUPPLY.—Lake Superior, pumping direct and to tank. PUMPS.—Cap., 1,000,000 galls.; Smith & Vaile dup. high-pressure. Youghiogheny bituminous coal used; av. cost, $2.50 per short ton, delivered. TANK.—Cap., 105,000 galls.; 30 × 20 ft., on 80-ft. wood tower. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by general taxation. Taps made by village. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 200,000; max., 250,000; min., 100,000. PRESSURE.—(In '89.) Ordinary, 50 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $35,000. Bonded debt, $30,000: $20,000, at 5%, due in 1909; $10,000, at 6%, due in 1911. Expenses, $4,057: Operating, $3,457; int., $1,600. Revenue, Consumers. $4,530. Deficits are all met by general taxation. MANAGEMENT.—Prest. of Village, Jas. H. Lunz; Ch. Pump. Engr., Wm. Porger. Rept. by Supt., John Dwan, July 10, 96. SEWERS.—Has partial sanitary and storm sewers.

83. **VIRGINIA**, Saint Louis Co. (Est., 3,647.) Built in '92 or '93 (?) by Virginia City Light & Water Co. (?). Engr. and Contr., Frank Amsler. FRANCHISE.—30 yrs. from '92. Co. is not exempt from local taxes. City to pay $1,700 per yr. No legal difficulties. SUPPLY.—Lake Virginia, pumping direct. DISTRIBUTION.—Mains, 8 miles. Taps, 15. Hydrants, public, 15. Rept. by Jno. Costin, Jr. SEWERS.—None.

84. **WASECA**, Waseca Co. (2,482.) Built in '94 by city; put in operation in Nov. Engr., C. F. Loweth, St. Paul. Contr., E. T. Sykes, Minneapolis. SUPPLY.—Well, 1,200 ft. deep, pumping by air-lift to tank, thence repumping to elevated tank. PUMPS.—Cap., 1,000,000 galls.: Gordon comp. dup. Also Pohle air-lift, with 10 × 14-in. Rand compressor. Illinois bituminous coal used; av. cost, $3 per short ton. TANKS.—Receiving: Cap., 175,000 galls.; steel, at ground level. Elevated: Cap., 100,000 galls.; wood, on 86-ft. steel tower. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 4 miles; cost extensions met by city. Taps, 150; made by consumer for $1. Services, lead and iron; paid for by consumer or property owner. Meters: 6; owned, controlled and repaired by city; yearly rental, none. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 60,000; max., 100,000; min., 40,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $30,000, at 6%; due in 20 yrs. Plant is operated in connection with city electric light plant and expenses and receipts are not kept separate. Rept. by D. S. Cummings, June 11, '96.

F 14. **WATERTOWN**, Carver Co. (362.) Built by village for fire protection. Supply, pumping direct, with 4½ × 7½ × 10-in. Worthington pump. Mains, 1¼ miles. Hydrants, 7. Pressure, ordinary, 70 to 100 lbs. Cost, $3,000. Expenses: Operating, $150. Supt., F. A. Barth. Rept. by Walter St. John, Oct. 5, '96. No sewers.

85. **WELLS**, Faribault Co. (1,208.) Built in '95 by village; put in operation in Apr. Engr., C. F. Loweth, St. Paul. Contrs., O. H. Oleson & Co., Stillwater. SUPPLY.—Artesian well, flowing into collecting well, pumping to tank. PUMPS.—Cap., 750,000 galls.; Gordon dup. Wilmington lump coal used; av. cost $3.90 per short ton. RESERVOIR.—Cap., 75,000 galls.; collecting well. TANK.—Cap., 79,000 galls.; wood; 26 × 20 ft., on steel tower 84 ft. high. DISTRIBUTION.—Mains, 1½ miles. Taps, 26; made by city for $2 each. Services, galv. i.; paid for by consumer. Village can compel use of meters and any consumer may have one. Hydrants, public, 16. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $17,000. Plant is run in conncetion with electric light plant. MANAGEMENT.—Recorder, A. O. Oleson; Ch. Pump. Engr., F. W. Perry. Rept. by Supt., A. C. Johnson, June 15, '96. SEWERS.—Has storm sewers only.

18. **WEST DULUTH**, Saint Louis Co. Now part of Duluth, which see.

86. **WILLMAR**, Kandiyohi Co. (1,825.) Built in '91 by village; put in operation in

July. SUPPLY.—Wells, pumping to tank. PUMP.—Cap., 1,000,000 galls.: 2—500,000 Stillwell-Bierce & Smith-Vaile. Wood used; av. cost, $2.40 per cord. TANK.—Cap., 60,000 galls.; 22 × 20 ft., on iron tower. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general fund. Taps, 153; made by city. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 100,000; max., 60,000. PRESSURE.—Ordinary, 44 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $20,000, at 6%, due June, 1921. Expenses, $2,600: Operating, $1,400; int., $1,200. Revenue: Consumers, $1,125. MANAGEMENT.—Prest., Benj. Williams. Rept. by Secy., Saml. Osmurdson, Sept. 21, '96. SEWERS.—Has sanitary and storm sewers.

87. **WINDOM,** Cottonwood Co. (835.) Built in '95 by village; put in operation Jan. 15, '96. Engr., Chas. F. Loweth; Contrs., Fairbanks, Morse & Co.; all of St. Paul. SUPPLY.—Artesian well, flowing into collecting reservoir, thence pumping to tank. PUMP.—Cap., 750,000 galls.; Deming triplex. Wilmington coal used; av. cost, $3.80 per short ton. TANK.—Cap., 135,000 galls.; steel; 25 × 35 ft., with conical bottom, on brick tower 50 ft. high. Total elevation, 132 ft. above main street. DISTRIBUTION.—Mains, 2.6 miles; cost extensions met by advance payments of water rents. Taps, 75; made by village for $10.50, including service to curb. Services, w. i. or galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 25; private, 20. PRESSURE.—Ordinary, 55 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $23,000. Floating debt for water and light plant, $32,000, at 7%. Deficits are met by general taxation. MANAGEMENT.—Mayor, C. W. Gillam; Recorder, W. Hale; Treas., W. A. Smith; Ch. Pump. Engr., F. Burbank. Rept. by Supt., A. Woolson, Jan. 8, and by Contrs., Jan. 1, '97. SEWERS.—Projected. REFERENCE.—Electric pumps, Eng. News, May 23, '96, illus. and inset.

88. **WINNEBAGO CITY,** Faribault Co. (1,106.) Built in '91 by city. Engrs., Smedley Mfg. Co., Dubuque, Ia. SUPPLY.—Well(?), pumping direct. PUMPS.—Cap., 500,000 galls. (press rept.); Smedley dup.; steam and water power used. Makers rept. 8 × 12-in. Rand air compressor for air-lift. Av. cost of coal used, $2.50 per short ton. RESERVOIR.—Storage. TANK.—On brick tower. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by assessment. Taps; made for consumer at cost of $10. Services, galv. i.; paid for by property owner. Meters: 2; owned, controlled and repaired by city. Use of meters compulsory for R. R. Co. and one farm. City can compel use of meters and any consumer may have one. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 37,800. PRESSURE.—Ordinary, 30 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $15,000. Expenses: Operating, $1,300. Revenue, $1,100. Deficits are met by general taxation. MANAGEMENT.—Prest. and Supt., Saml. Bacon; Recorder, Jno. N. Knutson; Treas., Ed. Moulton; Ch. Pump. Engr., Chas. Leet. Rept. by C. H. Garnsey, Dec. 15, '96. SEWERS.—None.

89. **WINONA,** Winona Co. (18,208.) Built in '76 by city. SUPPLY.—Two open and two artesian wells, pumping to stand-pipe. Open wells are near Mississippi River, each 38 × 50 ft. PUMPS.—Cap., 10,500,000 galls.: 6,000,000 Allis vert. triple exp.; 2,500,000 non-comp. and 2,000,000 comp. cond. Worthington. Wood and coal used; av. cost, $1.30 per short ton and shavings at 40 cents per load. STAND-PIPE.—Cap., 20,000 galls.; steel; 4 × 225 ft., enclosed in stone and brick tower with inside stairs. DISTRIBUTION.—Mains, 30 miles; cost extensions met by general city fund. Taps, 2,000; made by city for $1. Services, ¾ and 1¼-in. galv. i.; paid for by consumer. Meters, 118; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 300. CONSUMPTION.—(Galls.) av., 2,506,217. PRSESURE.—Ordinary, 45 to 60 lbs.; fire, 90 lbs. One steam fire engine is owned but not used. FINANCIAL.—Cost, $327,860. Bonded debt, $140,000, due 1902 to 1904; $36,500, at 4½%; $103,500, at 5%. Expenses, Operating, $13,260. Revenue, $15,831. MANAGEMENT.—Mayor, Addison B. Youmans; Recorder, L. D. Frost; City Treas., A. W. Laird; Engr., Geo. Z. Henston. Rept. by Water Comr., C. E. Kinne, June 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 17, '82.

90. **WINTHROP,** Sibley Co. (438.) Built in '91 by village. Engrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Driven well, pumping to tank. DISTRIBUTION.—Mains, 1 mile. Taps, 25. Services, lead; paid for by consumers. Meters, 0. Hydrants, public, 9. FINANCIAL.—Cost, $9,000. Bonded debt, $5,000. Deficits are all met by taxation. MANAGEMENT.—Prest., Ed. H. Huebner; Ch. Pump. Engr., J. H. Housman. Rept. by Recorder, F. M. Dimond, July 27, '96. SEWERS.—None.

91. **WORTHINGTON,** Nobles Co. (1,164.) Built in '91 by village. Engr., J. B. Hawley; Contrs., Harrison & Hawley; all of St. Paul. SUPPLY.—Well, 40 ft. deep, and lake, pumping from filter to tank and direct. PUMP.—Cap., 750,000 galls.; Smith-Vaile dup. La Salle (Ill.) bituminous coal used; av. cost, $4.25 per short ton. FILTER.—Charcoal and gravel. TANK.—Cap., 67,000 galls.; wood, 24 × 20 ft., on 80-ft. wood trestle. FISCAL YEAR CLOSED Mar. 15. DISTRIBUTION.—Mains (in '92), 3 miles; cost extensions met by village funds. Taps, 250; made by village for $10, including service to property line. Services, galv. i.; paid for by consumer. Meters: 6; owned by consumer; controlled and repaired by village. Village can compel use of meters and any consumer may have one. Hydrants, public, 34; private, 1. CONSUMPTION.—

(Galls.) av., 80,000. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $18,000. Bonded debt (in '92), $15,000. Revenue: Consumers, $2,400; City, none. MANAGEMENT.—Mayor, A. Forbes. Rept. by Supt., and Pump. Engr., P. L. Utley, June 10, '96. SEWERS.—Has storm sewers only.

92. **ZUMBROTA,** Goodhue Co. (867.) Built in '94 by village. Engr., C. F. Loweth, St. Paul. Contrs., O. H. Olson & Co., Stillwater. About ¼ mile of pipe for fire protection laid in '91 or earlier. SUPPLY.—Zumbro River, pumping to reservoir and direct. Press rept. in Jan., '97, stated an artesian well, pump and gasoline engine would be added. PUMP.—Cap., 500,000 galls.; Worthington fire. Pumping done by mill owner, under contract. RESERVOIR.—Cap., 150,000 galls.; 38 ft. diam., covered. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by village treasury. Meters: 5. Village can compel use of meters and any consumer may have one. Hydrants, 10. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $4,000, at 5%; due in 1905. Expenses: Operating, $250. MANAGEMENT.—Repts. by Recorder and by Engr., W. W. Kinne. PROJECTED IMPROVEMENTS.—Artesian well and gasoline engine pumping plant.

KANSAS.

1. **ABILENE,** Dickinson Co. (3,547.) Built in '82 by Abilene Water & Electric Light Co.; rebuilt in '90. See note. SUPPLY.—Sands springs, pumping direct. PUMPS.—Cap., 2,000,000 galls.: 1,000,000 Holly hor. dup.; 1,000,000 Worthington comp. non-cond. Repts. by makers. STAND-PIPE.—15 × 125 ft. DISTRIBUTION AND FINANCIAL.—Withheld. NOTE.—No official rept. since '90-1 Manual. Press repts. state: Works were bought by bondholders at master's sale, Mar. 8, '95, for $20,000, bonded indebtedness being $150,000. Also that in Apr., '95, Abilene Water Co. was incorp. at Portland, Me., with authorized cap. stock of $125,000, $500 paid-in; Prest., Wm. C. Eaton; Treas., Edw. D. Noyes; both of Portland. Dec., '96, press rept. stated city had been paying only $4,000 of $6,500 contract hydrant rental for past 2 yrs., owing to hard times, and that it had made proposition to pay only $2,500 per yr. hereafter. REFERENCE.—Eng. News, Dec. 16, '82.

2. **ANTHONY,** Harper Co. (1,806.) Now leased and operated by city; built in '87 by Anthony Improvement Co. SUPPLY.—Driven wells, near Bluff Creek; pumping to stand-pipe. PUMP.—Cap., 1,500,000 galls.; 2—750,000 Worthington, a comp. non-cond. and simple high pressure. STAND-PIPE.—Cap., 150,000 galls. DISTRIBUTION.—(In '88.) Mains, 8.5 miles. Taps, 250. Hydrants, 65. PRESSURE.—(In '88.) Ordinary, 110 lbs. FINANCIAL.—(In '88). Cap. Stock, $100,000: Bonded debt, $60,000. Expenses, Operating, $7,000. Revenue, $8,000: Consumers, $4,500; City, $3,500. MANAGEMENT.—Cy. Clk., J. P. Horton; Supt., W. E. Purcell. Rept. by Robt. M. Turner. No rept. since '88, except as to lease by city and management. Press repts. state city council passed resolution in May, '93, revoking franchise, alleging non-compliance; also that receiver was appointed in June, '93, on application by city. Apparently matter went into court and was compromised by lease of works to city in '94. REFERENCE.—Stand-pipe failure, Eng. News, Feb. 14, '95; stand-pipe, May 2, '95, illus.

3. **ARGENTINE,** Wyandotte Co. (4,732.) Built in '89-90 by Argentine Water & Electric Works Co. See note. FRANCHISE.—20 yrs. SUPPLY.—Six driven wells, pumping to tank. Press repts, state that in '95 Kaw River was being used as supply, and that contract had been let for 30 × 45-ft. well. PUMPS.—Cap., 2,800,000 galls.; 2—1,400,000 Deane comp. cond. dup. TANK.—Cap., 500,000 galls.; steel, 46 × 40 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 90. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—(In '89.) Ordinary, 110 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock: authorized, $90,000; paid-up, $75,000. Bonded debt, $100,000 (see note,) at 6%, due 1909. Expenses, $9,300: Operating, $4,000; int., $4,500; taxes, $800. Revenue, $5,500: Consumers, $1,000; City, $4,500. NOTE.—No official rept. since '90-1 Manual. Press rept., in '95, stated works were bid in by stockholders for $40,000 at judgment sale in '95, indebtedness then being over $180,000 including int. Also that Theo. Woodbury, Portland, Me., was member of reorganization com.

4. **ARKANSAS CITY,** Cowley Co. (8,847.) In receivers' hands; built in '83 by Arkansas City Water Co. City bought the equity Sept. 1, '91, but later it refused to pay int. on bonds, alleging that the franchise was invalid. Receiver was appointed by U. S. Court, Jan. 6, '93, on application of bondholders. See note. SUPPLY.—Spring and driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Blake comp. dup. non-cond. Arkansas semi-anthracite and Kansas semi-bituminous coals used; av. cost, $2.90 and $3.65, resp., per short ton. STAND-PIPE.—Cap., 73,000 galls.; iron; 10 × 125 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 22 miles. Taps, 691; made by consumer, no fee. Services, galv. 1. and lead; paid for by property owner. Meters: 26; owned, controlled and repaired by city. Meters are very quickly corroded by the water. City can compel use of meters, and any consumer may have one. Hydrants, public, 179. CONSUMPTION.—(Galls.) av., 800,000; max., 650,000; min., 185,000. PRESSUSE.—Ordinary, 65 to 75 lbs.;

fire, 115 lbs. FINANCIAL.—Bonded debt, $150,000, at 6%, due by default; with $24,000 int., in addition. Expenses: Operating, $5,000. Revenue, $8,300: Consumers, unmetered, $6,500; metered, $1,800. MANAGEMENT.—"Co. has disbanded." Ch. Pump. Engrs., J. W. Bennett and M. C. Moore. Rept. by Receiver, Geo. E. Hopper, June 5, '96. SEWERS.—Has sanitary sewers only. NOTE.—Press repts. state U. S. Circuit Court of Appeals, in Oct., '96, decided that franchise must stand; also that in Feb., '97, bondholders were trying to settle with city. Apparently bondholders have been trying to regain possession of plant.

5. **ATCHISON,** Atchison Co. (13,963.) Built in '80 by Atchison Water Co. FRANCHISE.—20 yrs. from '80; time extended to 1908; provides for purchase of works by city. Rates are fixed in franchise but not subject to regulation by city. Co. is not exempt from local taxes. SUPPLY.—Missouri River, pumping to reservoirs, thence by gravity. PUMPS.—Cap., 4,000,000 galls.; 2—1,000,000 Gordon-Maxwell; 2,000,000 Laidlaw-Dunn-Gordon comp. Bituminous coal used; av. cost, $2.20 per short ton. RESERVOIRS.—Cap., 5,250,000 galls.; settling basin, 1,250,000; storage, 4,000,000. DISTRIBUTION.—Mains, 13 miles. Taps, 800; made by Co. for $2. Services, galv. i.; paid for by consumer. Meters: 68; owned, controlled and repaired by Co. Use of meters compulsory for R. R.s, mills, etc. Co. can compel use of meters, and any consumer may have one. Hydrants, public, 103. CONSUMPTION.—(Galls.) av., 600,000; max., 750,000; min., 450,000. PRESSURE.—Ordinary, 30 to 90 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jno. D. Davis; Secy., Wm. K. Spinney, both of 421 Olive St., St. Louis, Mo.; Ch. Pump. Engr., W. D. Mitchell. Rept. by Supt., E. S. Wills, June 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Feb. 11, '82.

6. **BELLEVILLE,** Republic Co. (1,868.) Built in '89 by Belleville Water, Light & Power Co. FRANCHISE.—30 yrs. Provides for purchase of works by city. LEGAL DIFFICULTIES.—In July, '91, it was unofficially rept. that Co. was no longer in existence and works were in litigation. SUPPLY.—Wells and impounding reservoir on creek, pumping to tank and direct; filtered. RESERVOIR.—Area, 15 acres; within city limits. PUMPS.—Cap., 2,000,000 galls.: 2—1,000,000 Knowles comp. dup. FILTERS.—Gravity; 8 ft., sand, gravel and charcoal. TANK.—Cap., 66,000 galls. DISTRIBUTION.—Mains, 5.3 miles. Hydrants, 43. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $55,000. Bonded debt, $35,000, at 6%. Revenue: City, $3,440. NOTE.—No rept. since '90-1 Manual.

7. **BELOIT,** Mitchell Co. (2,455.) First supplied in '84 by works built by city, which sold works for $27,000 to E. E. Stevens & Co., Larned, who organized Beloit Water Co. FRANCHISE.—21 yrs. (probably from '85). Provides for purchase of works by city in 1905; rates are subject to regulation by city; Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. No legal difficulties. SUPPLY.—Wells on bank of Solomon River, pumping to tank. PUMPS.—Cap., 1,500,000 galls.; 1,000,000 Worthington and 500,000 Smith-Vaile. Av. cost of coal used, $3.40 per short ton. TANK.—Cap., 120,000 galls.; iron; 32 × 20 ft., on 70-ft. masonry tower. DISTRIBUTION.—Mains, cost extensions met by Co. Taps made by Co. for $10. Use of meters optional with consumer. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Bonded debt, $54,000, at 6%. Sinking Fund, none. MANAGEMENT.—Prest., E. E. Stevens. Rept. by A. T. Rodgers, June 1, '96. SEWERS.—Has sanitary sewers.

8. **BIRD CITY,** Cheyenne Co. (145.) Built in '87-8 by village. SUPPLY.—Four 3-in. tube wells, about 240 ft. deep, pumping to tank. PUMPS.—Cap., 660,000 galls.; four vertical. TANK.—Cap., 85,000 galls. DISTRIBUTION.—Mains, 1 mile. Hydrants, 6. FINANCIAL.—Cost, $5,000. Expenses, $500. Revenue, $500. NOTE.—No rept. since '90-1 Manual.

9. **BLUE RAPIDS,** Marshall Co. (905.) Fire-protection works, built in '74 by city; present works built in '89-91, by city. SUPPLY.—Wells, pumping to reservoir. PUMPS.—Cap., 2,500,000 galls.; Deane. RESERVOIR.—Cap., 200,000 galls. DISTRIBUTION.—(In '90.) Mains, 2.5 miles. Hydrants, public, 17. PRESSURE.—(In '89.) Ordinary, 80 lbs.; fire, av., 105 lbs. FINANCIAL.—(In '90.) Cost, $20,000. Bonded debt, $20,000: $8,000 at 6%; $12,000 at 5%. MANAGEMENT.—Water Comr., S. A. Craft. Rept. by Cy. Clk., E. A. Garrison, Oct. 3, '96.

10. **BUNKER HILL,** Russell Co. (157.) Now owned in city; built in '76 by Bunker Hill Water Co. SUPPLY.—Springs, pumping to tank and direct. PUMP.—Cap., 130,000 galls.; 100,000 Deane and 30,000 Hopkins. TANK.—Cap., 60,000 galls.; 26 × 16 ft. FISCAL YEAR CLOSED in Apr. DISTRIBUTION.—(In '90.) Mains, 3.8 miles. Taps, 35. Hydrants, 12. PRESSURE.—(In '89.) Ordinary, 30 lbs. FINANCIAL.—Cost to city, $6,500. Bonded debt, $6,500 at 7%, due 1909. Sinking Fund, $900. Expenses, $655: Operating, $200; Int., $455. Revenue, $200. MANAGEMENT.—Mayor, Chas. Hoopman. Rept. by Cy. Clk., W. H. Brays, Sept., 23, '96.

11. **BURLINGTON,** Coffey Co. (2,289.) Built in '86-7 by Burlington Water-Works Co. FRANCHISE.—21 yrs. from '87. Rates are fixed in city ordinance. Co. is not exempt from local taxes. City to pay $3,500 per yr. for 70 hydrants. LEGAL DIFFICULTIES.—Suit for hydrant rental was in courts for 8 yrs. and was unsettled at time of rept.

Press repts., at later date, stated Co. had secured judgment against city in one of several suits. SUPPLY.—Neosho River, pumping to stand-pipe; filtered. PUMPS.—Cap., 2,000,000 galls.; Deane, comp. dup. and simple. Av. cost of coal used, $2 per short ton, delivered. FILTER.—Cap., 500,000 galls.; Jewell. RESERVOIR.—Cap., 60,000 galls.; supply basin. STAND-PIPE.—Cap., 45,000 galls.; 8 × 120 ft. DISTRIBUTION.—Taps, 153, only ⅔ in use; made by Co. Services paid for by consumer. Meters, 1; owned, controlled and repairs paid by Co.; yearly rental, none. Co. cannot compel use of meters, but may prohibit them. Hydrants, public, 70. PRESSURE.—Ordinary, 35 lbs. FINANCIAL.—(In '90.) Bonded debt, $60,000 at 6%. Expenses, $5,400: Operating, $1,800; int., $3,600. Revenue, $5,440: Consumers, $1,940; City, fire protection, $3,500. MANAGEMENT.—Rept. by Supt., E. C. Pfuetze, July 13, '96. SEWERS.—None. REFERENCE.—Filtration, Eng. News, May 28, '96.

12. **CALDWELL,** Summer Co. (1,642.) Built in '86 by Caldwell Water Supply Co. FRANCHISE.—21 yrs. from '89. Rates were fixed by city. City to pay $3,000 per yr. for 55 hydrants, and $45 each for additional. SUPPLY.—Bluff Creek, pumping from impounding reservoir to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington, a comp. non-cond. and a simple high-pressure. FILTERS.—Cap., 500,000 galls.; National (New York). RESERVOIR.—Cap., 35,000,000 galls.; impounding, formed by 8 ft. masonry dam. STAND-PIPE.—Cap., 127,000 galls.; 12 × 150 ft., bottom 30 ft. above town. DISTRIBUTION.—Mains, 6 miles. Taps, 142. Meters, none. Hydrants, public, 55. PRESSURE.—Ordinary, 70 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $81,564. Expenses: Operating, $3,000. Revenue: Consumers, $4,187; City, fire protection, $3,045. NOTE.—Latest rept., by H. H. Bowby, 45 Wall St., N. Y. City, Dec. 31, '91. Works were then in hands of receiver. Inquiry sent to Caldwell in '96 returned stating "no changes since last rept." Press rept. stated works would be sold at sheriff's sale, Sept. 1, '93. REFERENCES.—Stand-pipe accident, Oct. 6, '88, Apr. 12, '94.

13. **CHANUTE,** Neosho Co. (2,826.) Built in '95 by city; put in operation in Sept. Contr., J. Geager. SUPPLY.—Neosho River, pumping direct. PUMPS.—Two Worthington dup. Run of mine bituminous coal used; av. cost, $2.10 per short ton. FILTERS.—Cap., 2,000,000 galls.; crushed sandstone. RESERVOIR.—Distributing, pumping into one basin, supplied to city from the other. DISTRIBUTION.—Mains, 10 miles. Taps, 125; made by city for $1. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 65. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $53,000(?): $14,000 refunding, at 5%, due in 1905 and 1910: $39,000, at 6%, due in 1905. Sinking Fund, none. Expenses, $5,340: Operating, $3,000; int., $2,340. MANAGEMENT.—Rept. by Cy. Clk., J. W. Buchanan, June 10, '96. SEWERS.—None.

14. **CHEROKEE,** Crawford Co. (1067.) Built in '96 by city; completed and put in operation Aug. 1. Engrs. and Contrs., Fairbanks, Morse & Co., Kansas City, Mo. SUPPLY.—10-in. well, 980 ft. deep, pumping to tank and direct. PUMP.—Cap., 120,000 galls.; deep well. Av. cost of coal used, $1.50 per short ton. TANK.—Cap., 60,000 galls.; 21 × 24 ft., on brick tower 70 ft. high. DISTRIBUTION.—Mains, 3 miles; cost extensions met by profits and taxes. Taps, 100; made by city. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $15,000. Debt, $15,200: Floating, $200. Bonded, $15,000, at 5%, interest due until 1907, then $1,000, yearly. Expenses, $1,500: Operating, $600; int., $90. Revenue: City, fire protection, $1,200. MANAGEMENT.—Mayor, G. W. Brown; Treas., G. W. Pye; Supt., Paul Campbell. Rept. by Clk., J. F. Price, Dec. 14, '96. SEWERS.—None.

15. **CHERRY VALE,** Montgomery Co. (2,104.) Built in '85 by Cherry Vale Water & Mfg. Co.; now Cherry Vale Water Co. FRANCHISE.—21 yrs. from '85. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $2,750 per year for public service. No legal difficulties. SUPPLY.—Lake, siphoned into 245,000-gall. receiving well through filter, thence pumping to stand-pipe. PUMP.—Cap., 1,512,000 galls.; Dean dup. Bituminous nut coal used; av. cost, $2 per short ton. FILTERS.—Gravity. STAND-PIPE.—Cap., 37,600 galls.; 8 × 100 ft., on stone foundation. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 8 miles; cost extensions met by Co. Taps, 150. Services, paid for by consumer. Use of meters optional with consumer. Hydrants, public, 46. CONSUMPTION.—(Gall.) av., 150,000. PRESSURE.—Ordinary, 20 lbs.; fire, 70 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $100,000. No debt. Expenses, $2,760: Operating, $2,460; taxes, $300. Revenue: City, fire protection, $2,750. MANAGEMENT.—Prest., Jno. C. MacMurray; Cecy. and Treas., Chas. P. Armstrong, 102 Wall St., N. Y. City. Rept. by Supt., J. M. Courtney, June 5, '96. SEWERS.—None.

—? **CIMARRON,** Gray Co. (Township, 445.) U. S. Wind Engine & Pump Co., Batavia, Ill.; rept. that they furnished material or built works here.

16. **CLAY CENTRE,** Clay Co. (2,802.) Bought by city in '93 for $39,800, at close of litigation; built in '85 by Clay Centre Water Co. Fire protection furnished Dec., '84. SUPPLY.—Surface water and well for domestic use, river for fire protection, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 1,500,000 Holly hor. dup.; other not given. DISTRIBUTION.—Mains, 4 miles. Taps, 250. Meters, 0. Hydrants, public, 40. FINANCIAL.—Cost, $39,800 (purchase price). Bonded debt, $35,000, at 6%. Expenses, Operat-

ing, $2,400. Revenue: Consumers, $2,800. MANAGEMENT.—Rept. by Secy. W. Comrs., Walker Puckey, Sept. 23, '96.

17. **CLYDE,** Cloud Co. (1,137.) Built in '87 by village. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 150,000 galls.; two Deane comp. dup. DISTRIBUTION.—Mains, 4 miles. Taps, 137. Meters, 0. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 80,000. FINANCIAL.—(In '88.) Cost, $30,000. Expenses, $1,240; int., 6%. Revenue, Consumers, $1,452. MANAGEMENT.—Rept. by Supt., F. G. Groff, Oct. 5, '96.

18. **COFFEYVILLE,** Montgomery Co. (2,282.) Built in '95 by city; put in operation Dec. 10. Des. Engr., Jno. M. Walker; Cons. Engr., J. W. Nier. No Contr. SUPPLY.—Verdigris River, pumping to reservoir. PUMP.—Cap., 2,000,000 galls.; 2—1,000,000 Snow comp. Gas used; the city owns a gas well, 809 ft. deep. AERATING PLANT.—Cap., 40 cu. ft. per min., under 20 lbs. pressure; a 2-in. galv. i. pipe extends to reservoir, 1,400 ft. distant. RESERVOIR.—Cap., 3,000,000 galls.; circular, with wall nearly across center; inlet and outlet on opposite sides of wall; 200 ft. above river and 178 ft. above city. DISTRIBUTION.—Mains, 10 miles; cost extensions met by city. Taps, 134; made by city at $5 for ½-in. and $6 for ¾-in., including service pipe to within 10 ft. of property line. Services, galv. i.; paid for by property owner. Meters: 44; owned by consumer; controlled and repairs paid by city; yearly rental, $3. Use of meters compulsory for mills, factories and R. R. City can compel use of meters and any consumer may have one. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, $47,858. Bonded debt, $49,000 at 6%; due in 1916. Sinking Fund, none. Expenses, $4,450: Operating, about $1,500; int., $2,950. Revenue, $2,100. MANAGEMENT.—Mayor, J. H. Wilcox; Clerk, A. J. Sullivan. Rept. by Supt. and City Engr., John M. Walker, June 12, '96. SEWERS.—None.

19. **COLUMBUS,** Cherokee Co. (2,160.) Built in '86-7 by Columbus Water Works Co. FRANCHISE.—Exclusive; 99 yrs., with hydrant contract for 21 yrs. Franchise permits the purchase of works by city at expiration of contract, and each 5 yrs. thereafter. Max. rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $3,000 per yr. for 50 hydrants, additional ones at $50 each. LEGAL DIFFICULTIES.—City tried to annul contract, claiming former council had no authority to make it. Supreme Court decided in favor of Co. SUPPLY.—Artesian well, 1,300 ft. deep, pumping to storage reservoir; repumping to stand-pipe and direct. PUMPS.—Cap., 1,400,000 galls.: 400,000 Blake deep well; 1,000,000 Buffalo. Bituminous coal used; av. cost, $1.10 per short ton. RESERVOIR.—Cap., 300,000 galls. STAND-PIPE.—Cap., 127,000 galls.; iron; 12 × 150 ft. DISTRIBUTION.—Mains, 4¾ miles. Taps, 127; made by consumer, no fee. Services, galv. i.; paid for by consumer. Meters: 2; owned and repairs paid by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50; private, 1. CONSUMPTION.—(Galls.) av., 40,000; max., 50,000; min., 30,000. PRESSURE.—Ordinary, 70 lbs.; fire, 150 lbs. FINANCIAL.—Cost (in '90), $60,000. Cap. Stock: Authorized, $100,000. Bonded debt, $60,000, at 6%, due in 1907. Sinking Fund, none. Expenses: Operating, $1,700. MANAGEMENT.—Prest., L. L. Doubleday; Secy., C. B. Hunt; Ch. Pump. Eng., C. P. McNulty. Rept. June 5, '96. SEWERS.—Has partial system of storm sewers only.

20. **CONCORDIA,** Cloud Co. (3,184.) Built in '87-8 by town. SUPPLY.—Cook well system, near Platte river, pumping to stand-pipe. Contract was awarded in Apr., '94, for 10 6-in. driven wells and 1,000,000-gall. comp. dup. pump; Engr., W. Kiersted, Kansas City. PUMPS.—Cap., 1,500,000 galls.; Deane comp. dup. (rept. by makers). See above. STAND-PIPE.—Cap., 95,000 galls.; 15 × 75 ft. DISTRIBUTION.—Mains, 6.3 miles. Taps, 193. Meters, 1. Hydrants, 50. PRESSURE.—(In '88.) Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $45,000, at 5%; due in 1907. Expenses, $4,050: Operating, $1,800; int., $2,250. Revenue: Consumers, $1,800. NOTE.—No rept. since '90-1 Manual.

21. **CONWAY SPRINGS,** Sumner Co. (681.) Now owned by city; built in '88 by Conway Springs Water Co., which became insolvent in Nov., '89. SUPPLY.—Well, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls. STAND-PIPE.—Cap., 17,000 galls.; 6 × 80 ft. DISTRIBUTION.—(In '88.) Mains, 2.8 miles. Taps, 27. Hydrants, public, 8. FINANCIAL.—(In '88.) Cost, $12,000. Expenses, $7,000. Revenue, $1,200. MANAGEMENT.—Rept. by Clk., E. L. Cline, Sept. 30, '96.

22. **COOLIDGE,** Hamilton Co. (472.) Built in '88-9 by Peck Water-Works Co. FRANCHISE.—Provides neither for control of rates nor for purchase of works by city. SUPPLY.—Two artesian and one surface well, pumping from receiving reservoir direct and to stand-pipe. PUMP.—Cap., 125,000 galls.; Hughes comp. dup. RESERVOIR.—Cap., 390,000 galls. STAND-PIPE.—Cap., 110,000 galls. DISTRIBUTION.—Mains, 3 miles. PRESSURE.—(In '88.) Ordinary, 55 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $43,000. Cap. Stock: Common, authorized, $60,000; paid-up, $43,000; paid 3½% div'd in '90. No debt. Sinking Fund, $259. Expenses, $1,635: Operating, $1,500; taxes, $135. Revenue, $3,264: Consumers, $2,544; City, fire protection, $720. NOTE.—No rept. since '90-1 Manual.

23. **COUNCIL GROVE,** Morris Co. (2,211.) Built in '87-8 by Council Grove Water Co. FRANCHISE.—25 yrs. from '87. Rates are subject to regulation by city. Co.

is not exempt from local taxes. No legal difficulties. SUPPLY.—Well, near river, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Davidson. Bituminous coal used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 395,000 galls; steel; 80 × 75 ft., on elevation of 75 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5 miles. Taps, 150; made by Co. for $1.50 each. Services, galv. i.; paid for by consumer. Meters: 3; owned, controlled and repaired by consumer. Use of meters compulsory for R. Rs. Co. can compel use of meters and any consumer may have one. Hydrants, public, 42. CONSUMPTION.—(Galls.) av., 80,000; max., 250,000. PRESSURE.—Ordinary, 50 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $80,000. MANAGEMENT.—Prest., Wm. Runkle; Secy. and Treas., W. E. Stiger; both of New York. Rept. by Supt., Preston Little, Aug. 17, '96.

24. **CULLISON,** Pratt Co. (Est., 500.) Built in '88 by village and Wichita & Western R. R. Co., village owning distribution only. SUPPLY.—Well, 18 × 110 ft., pumping to tank. PUMP.—Cap., 144,000 galls.; Knowles. TANK.—Cap., 54,000 galls.; 24 × 16 ft., on 24 ft. tower. DISTRIBUTION.—Mains, 1.5 miles. Taps, 40. Hydrants, 12. PRESSURE.—(In '88.) Ordinary, 80 lbs.; fire, 90 lbs. FINANCIAL.—(For city.) Cost, $6,500. Bonded debt, $6,500, at 7%. Expenses, paid by Ry. Revenue, $300. NOTE.—No rept. since '90-1 Manual.

25. **DODGE CITY,** Ford Co. (1,763.) Built in '87 by Dodge City Water Supply Co. SUPPLY.—Pumping to tank. PUMP.—Cap., 750,000 galls.; Smith & Vaile. TANK.—Cap., 80,000 galls. DISTRIBUTION.—Mains, 5 miles. Hydrants, 50. PRESSURE.—(In '88.) Ordinary, 130 lbs. FINANCIAL.—Revenue: City, $2,500. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Stand-pipe accident, Eng. News, Apr. 25, '95.

26. **DOWNS,** Osborne Co. (938.) Built in '88 by village. Supplies water for domestic use, fire protection and irrigation. SUPPLY.—Eight Wagner wells, pumping to stand-pipe. PUMP.—Cap., 200,000 galls.; Deane comp. dup. STAND-PIPE.—Cap., 100,000 galls. DISTRIBUTION.—Taps, 150; made by village, free. Services, ¾-in.; paid for by consumer. Use of meters optional with consumer. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 100,000; max., 200,000; min., 10,000. PRESSURE.—Ordinary, 40 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $30,000: Floating debt, $30,000. Rept. by J. W. Keirns, July 10, '96.

27. **EL DORADO,** Butler Co. (3,389.) Built in '87 by El Dorado Water Supply Co.; owned by F. A. Faulkner. Press rept. states works were sold in Jan., '92, for $70, subject to $60,000 mortgage. SUPPLY.—Well and Walnut River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; Blake. Bituminous slack used; av. cost, $2.15 per short ton. STAND-PIPE.—Cap., 120,000 galls.; steel; 12 × 145 ft. DISTRIBUTION.—Taps, 461; made by consumer, no fee to Co. Services, galv. i.; paid for by property owners. Meters: 7; owned and repairs paid by property owner; controlled by Co.; yearly rental, none. Use of meters compulsory for motors, livery stables, lawns and gardens. Co. can compel use of meters and any consumer may have one. Hydrants, public, 62. CONSUMPTION.—(Galls.) av., 120,782; max., 180,458; min., 88,528. PRESSURE.—Ordinary, 90 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $75,000. Bonded debt (see above). Expenses, taxes, $643. MANAGEMENT.—Ch. Pump. Engr., Geo. F. Heyman. Rept. by Supt., Wm. H. Fountain, July 17, '96. SEWERS.—None.

28. **ELLSWORTH,** Ellsworth Co. (1,620.) Built in '86 by town. SUPPLY.—Driven wells, pumping to tank. PUMPS.—Cap., 3,500,000 galls.; Smith-Vaile; also 200,000 Buffalo, perhaps for a well. Bituminous slack coal used; av. cost, $3 per short ton. TANK.—Cap., 100,000 galls.; on stone tower. DISTRIBUTION.—Mains, 4 miles. Taps, 150. Meters: 6: owned, controlled and repaired by city; yearly rental, none. Use of meters optional with consumer. Hydrants, public, 64. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—(In '88.) Cost, $50,000. Bonded debt, $50,000, at 6%. Expenses, $4,500: Operating, $1,500; int., $3,000. Revenue: Consumers, $1,200. Rept. by Ellsworth Electric Light Co., June 12, '96. SEWERS.—None.

29. **EMPORIA,** Lyon Co. (7,551.) Built in '80-2 by city. SUPPLY.—Neosho River, pumping to reservoir and direct. PUMPS.—Cap., 3,500,000 galls.: 1,500,000 Holly quadruplex; 2,000,000 Holly vert. high duty. RESERVOIR.—Cap., 15,000,000 galls. FISCAL YEAR CLOSED in Mar. DISTRIBUTION.—(In '92.) Mains, 25 miles. Taps, 855. Meters, 0. Hydrants, 112. PRESSURE.—(In '88.) Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—Cost (June, '94), about $280,000. Bonded debt (June, '94), $227,000: $50,000 at 7%, due in '99; $177,000, at 5%. due mostly in 1907. Sinking Fund: $15,000 at 5%, due in 1910. Expenses (in '91-2), $18,137: Operating, $5,787; int., $12,350. Revenue (in '91-2): Consumers, $7,503. NOTE.—No rept. since '90-1 Manual, except figures under distribution and financial, which are from city repts. in '92 and '94. REFERENCE.—Eng. News, Feb. 18, '82.

30. **ENTERPRISE,** Dickinson Co. (804.) Built in '89 by city, under arrangement with J. B. Ehrsam Machine Co., by which city paid Co. $10,000 per yr. for building works, and was to pay $300 per yr. to Co. for pumping. Co. now in hands of receiver, who in '96 threatened to discontinue service unless $1,200 per yr. was paid by city. City appealed to court, which ordered receiver to continue service. In Dec., '96, compromise was made, city agreeing to pay $600 per yr. (Press repts.) SUPPLY.—Surface wells, pumping direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 water-power, made

by above Co.; no auxiliary steam plant. FISCAL YEAR CLOSED July 31. DISTRIBUTION.—Mains, nearly 3 miles; cost extensions will be met by the city. Taps made by city. Services, w. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 700,000; max., 1,000,000; min., 500,000. PRESSURE.—Ordinary, 60 lbs.; fire 120 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $10,000, at 6%; due in 1909. Expenses, $1,200: Operating, $600; int., $600. Revenue, $600 to $800. Rept. (except as noted) by James Frey, Dec. 5, '96. SEWERS.—None.

31. **EUREKA,** Greenwood Co. (2,259.) Built in '88-9 by city. SUPPLY.—Fall River, pumping to stand-pipe. PUMPS.—Cap., 120,000 (?) galls.; 2—60,000 Deane dup. Bituminous slack used; av. cost, $2.10 per short ton. FILTERS.—Sand, charcoal and gravel. STAND-PIPE.—Cap., 53,000 galls.; iron; 18½ × 50 ft. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 6 miles; cost extensions met by general fund. Taps, 150. Services, iron; paid for by property owner. Meters, 12; owned and controlled by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 39. CONSUMPTION.—(Galls.) av., 48,000; max., 49,000; min., 27,000. PRESSURE.—Ordinary, 60 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost about $55,000. Bonded debt, $40,000, at 5%; due in 1918. Expenses, $3,825: Operating, $1,825; int., $2,000. Revenue, $1,930: Consumers, unmetered, $1,670; metered, $260. Tax is levied for $2,000 int. Balance of deficit, if any, is paid out of general fund. MANAGEMENT.—Rept. by Cy. Clk., J. H. Smythe, June 22, '96. SEWERS.—None.

32. **FLORENCE,** Marion Co. (1,229.) Owned since Mar., '89, by Shickle, Harrison & Howard Iron Co., St. Louis, Mo.; built in '87-8 by Florence Water Supply Co. FRANCHISE.—20 yrs. from '88; if city does not buy works at expiration, franchise is to be extended for 20 yrs. longer. Max. rates are fixed in franchise. No legal difficulties. SUPPLY.—Cottonwood River, pumping from filtering gallery to tank and direct. PUMPS.—Cap., 700,000 galls.; 2—350,000 Deane. Pittsburg (Kan.), slack used; av. cost, $2.25 per short ton. TANK.—Cap., 82,000 galls.; iron, 16 × 55 ft., on stone tower 55 ft. high; on hill 80 ft. above city. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 3¼ miles. Taps, 64; made by Co. for $3.25. Services, galv. i.; paid for by consumer. Meters: 12; owned by Co. or consumer; controlled by Co.; repairs paid by consumer. Use of meters compulsory for motors, etc. Co. can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 125,000; max., 150,000; min., 80,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Cost, about, $40,000. Revenue, City, fire protection, $1,200. MANAGEMENT.—Rept. by Prest. and Supt., D. Waterman, June 5, '96. SEWERS.—None.

33. **FORT SCOTT,** Bourbon Co. (11,946.) Built in '82 by Ft. Scott Water Co. See note. SUPPLY.—Marmaton River, pumping from two impounding reservoirs to stand-pipe and direct. See note. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington comp. non-cond. RESERVOIRS.—Cap., 89,000,000 galls: impounding 85,000,000, formed by two solid masonry dams; distributing, 4,000,000. STAND-PIPE.—Cap., 100,000 galls.; ½-in. w. i., 14 × 80 ft., on stone foundation 30 ft. high. DISTRIBUTION.—Mains, 24 miles. Taps, 1,500. Meters, 50. Hydrants, 80. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Bonded debt, see note. Expenses, about $4,200. Revenue, about $18,000. NOTE.—No official rept. since '90-1 Manual. In Apr., '94, receiver was appointed; Co. having defaulted on int. Several actions brought in '96 resulted in decision on Mar. 1, '97, by U. S. Court at Ft. Scott, giving judgment to Farmers' Trust Co., of Cleveland for $50,000 on first mortgage bonds; $100,000 to Atlantic Trust Co., of New York on second mortgage bonds; and declaring $100,000 of third mortgage bonds invalid, because not lawfully issued. At same date there were outstanding $60,000 of receiver's certificates, issued in '96, for improvements, contracts having been let in '96 for new mains and a large stand-pipe. Receiver, S. R. Worthington. (Press repts.) REFERENCE.—Eng. News, Jan. 31, '85.

34. **FREDONIA,** Wilson Co. (1,515.) Built in '87-8 by Jas. O'Neil under name of Fredonia Water Co. FRANCHISE.—20 yrs. from '87. Provides for purchase of works by city. SUPPLY.—Fall River, 1½ miles distant, pumping direct or to reservoir. PUMPS.—Cap., 2,000,000 galls.; two Deane, one comp., and one high pressure. RESERVOIR.—Cap., 3,000,000 galls.; 196 ft. above town. DISTRIBUTION.—Mains, 7 miles. Taps, 135; made for $5. Services, galv. i.; paid for by consumer. Meters: 1; owned, controlled and repairs paid by Co. Use of meters optional with consumer. Hydrants, public, 52. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—(In '90.) Cost, $88,000. Bonded debt, $75,000, at 6%. Expenses, $6,300: Operating, $1,800; int., $4,500. Revenue, $9,420: Consumers, $6,300; City, $3,120. MANAGEMENT.—Prest., J. R. Willets; Treas., Jno. A. Cole, Chicago; Ch. Pump. Engr., Frank Hunt. Rept. by Supt., Benj. S. Paulen, June 15, '96. SEWERS.—None.

35. **GALENA,** Cherokee Co. (2,496.) Built in '89 by Galena Water Co. FRANCHISE.—20 yrs. SUPPLY.—Shoal River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,500,000 galls.: 1,250,000 Smith & Vaile; 1,250,000 Snow comp. dup., now under construction. STAND-PIPE.—Cap., 105,000 galls.; steel, 12½ × 125 ft. FISCAL YEAR CLOSED May 5, '96. DISTRIBUTION.—Mains, 6 miles. Taps, 575. Meters, 13. Hydrants, public, 52. PRESSURE.—(In '89.) Ordinary, 90 lbs. FINANCIAL.—Cost, $65,589. Bonded debt, $40,000, at 6%. Expenses, $5,083: Operating, $2,683; int., $2,400. Reve-

nue, $9,399: Consumers, $6,499; City, fire protection, $2,900. MANAGEMENT.—Prest., S. N. Dwight; Secy., R. G. Dwight; Supt., W. J. Land. Rept. by Prest., for works as they stood on May 1, '96.

36. **GARDEN CITY,** Finney Co. (1,490.) Built in '87 by city. SUPPLY.—Surface well, 17½ × 19 ft., in Kansas River valley, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; two Buffalo comp. dup. Trinidad bituminous coal used; av. cost, $4.85 per short ton. STAND-PIPE.—Cap., 76,000 galls.; 10 × 130 ft. DISTRIBUTION.—Taps, 200; made by city for $8. Services, ¾-in.; paid for by consumer. Meters, 0. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 300,000. FINANCIAL.—Cost, $60,000. Bonded debt, $40,000, at 6%, due in 1900. Sinking Fund: $20,000, invested in bonds. Expenses, Operating, $2,000. Rentals pay running expenses, excluding interest on bonds. MANAGEMENT.—Prest., Geo. H. De Waters. Rept. by Supt., W. E. Trull, June 8, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Stand-pipe failure, Eng. News, Oct. 1, '96, illus.

37. **GARNETT,** Anderson Co. (2,191.) Built by city; put in operation Jan. 1, '91. SUPPLY.—Crystal Lake, pumping to stand-pipe. PUMP.—Cap., 750,000 galls.; Barr dup. STAND-PIPE.—Cap., 42,000 galls.; 12 × 50 ft., on 72-ft. brick tower. DISTRIBUTION.—Mains, 4.5 miles. Hydrants, 30. PRESSURE.—Ordinary, 50 lbs.; fire, 70 to 80 lbs. FINANCIAL.—Cost, $22,000. Bonded debt, $30,000, at 6%. NOTE.—No rept. since '90-1 Manual.

38. **GIRARD,** Crawford Co. (2,541.) Built in '82 by city. Up to '90 city had granted four franchises for private works, none of which had been built; city plant was reported as in dilapidated condition. SUPPLY.—Artesian well, 5 ins. × 800 ft., pumping to tank. Improvements were proposed in '93, including a 10-in. × 800-ft. well, new pumps, a 350,000-gall. reservoir and a 24 × 18-ft. tank, on a brick tower; Engr., G. W. Pearsons, Kansas City, Mo. PUMPS.—Windmill, with steam for emergency. TANK.—Cap., 60,000 galls.; wood, 24 × 18 ft., on 30-ft. timber trestle. DISTRIBUTION.—Mains, 1 mile in '84; 2-mile extension was proposed in '93. Taps, 35. Meters, 0. Hydrants, 4. FINANCIAL.—(In '84.) Cost, $10,000. Debt, $8,000, at 7%. Expenses, operating, $150. Revenue, consumers, $600. NOTE.—No rept. since '90-1 Manual, when works were said to be worn out and new system desired. REFERENCE.—Eng. News, Feb. 7, '85.

39. **GREAT BEND,** Barton Co. (2,450.) Now owned by N. W. Harris & Co., New York City; built in '87-8 by Great Bend Water Supply Co. FRANCHISE.—City may purchase works in '97; if it does not, must buy them in 1907 at appraised value. Rates are fixed in franchise. No legal difficulties. SUPPLY.—Seven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; two Buffalo. Bituminous nut coal used; av. cost, $3.90 per short ton. STAND-PIPE.—Cap., 120,000 galls.; 12 × 150 ft., on stone foundation. DISTRIBUTION.—Mains: Cost, extensions met by Co. Taps, 175; made by Co., no fee. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 51. CONSUMPTION.—(Galls.) av., 255,000. PRESSURE.—Ordinary, 60 lbs.; fire, 110 lbs. FINANCIAL.—Cap. Stock, $100,000. Bonded debt, $40,000, at 6%. Expenses, $4,800: Operating, $2,000; int., $2,400; taxes, $400. Revenue, $4,200: Consumers, $1,700; City, $2,500. Rept. by Chas. E. Dodge, July 27, '96. SEWERS.—None.

40. **GREENLEAF,** Washington Co. (916.) Built in '86 by city. SUPPLY.—Eight Wagner wells, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Deane comp. dup. STAND-PIPE.—Cap., 84,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by city out of general fund. Taps, 100. Hydrants, public, 13. FINANCIAL.—Cost, $26,400. Rept. by W. P. Midgett, Sept. 29, '96.

41. **GREENSBURGH,** Kiowa Co. (515.) Now owned by city; built in '87-8 by Greensburgh Water Supply & Hydraulic Power Co. Kansas National Bank, Wichita, purchased system at foreclosure sale and sold it to city (probably in '92). SUPPLY.—Wells, pumping to tank and direct. First well, 30 × 96 ft. PUMPS.—(In '89.) Cap., 150,000 galls.; two Knowles comp. dup. Pump cylinders are in well 80 ft. below surface. TANK.—Cap., 117,000 galls.; 25 × 32 ft., on 76-ft. oak trestle. DISTRIBUTION.—(In '88.) Mains, 3 miles. Hydrants, public, 35. FINANCIAL.—(In '88.) Cost, $68,000. MANAGEMENT.—Rept. by Mayor, J. Y. Canfield.

42. **HANOVER,** Washington Co. (903.) Built in '95 by city. Des. Engr., A. A. Richardson, Lincoln, Neb. SUPPLY.—Little Blue River, pumping to stand-pipe. FINANCIAL.—Cost, $18,000.

43. **HARPER,** Harper Co. (1,579.) Built in '86-8 by Harper Water Co. FRANCHISE.—21 yrs. SUPPLY.—Artesian wells, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; two Smith & Vaile comp. dup. STAND-PIPE.—Cap., 160,000 galls.; 15 × 125 ft. DISTRIBUTION.—(In '89.) Mains, 5.5 miles. Taps, 50. Meters, 1. Hydrants, 64. PRESSURE.—(In '88.) Ordinary, 52 lbs.; fire, 150 lbs. FINANCIAL.—(In '89.) Cost, $100,000. Cap. Stock, $150,000. Bonded debt, $100,000. Expenses, operating, $2,000. Revenue, consumers, $400. NOTE.—No rept. since '90-1 Manual.

44. **HERINGTON,** Dickinson Co. (1,353.) Leased by Herington Water, Light & Power Co. for 25 yrs., which was incorp. in Aug., '95; built by city, probably since '91. Co. has authoried capital stock of $25,000. Directors (in '95): H. S. J. Towner (who transferred lease to Co.), Herington; F. E. Burroughs, Kansas City.

45. **HIAWATHA,** Brown Co. (2,486.) Built in '87-8 by town. SUPPLY.—Surface

wells, pumping to stand-pipe. PUMP.—Cap., 250,000 galls.; two Deane comp. cond. Rich Hill (Mo.) bituminous coal used; av. cost, $1.90 per short ton. STAND-PIPE.—Cap., 110,000 galls.; 12 × 130 ft. DISTRIBUTION.—Taps, 140; made by city for $10. Services, galv. i.; paid for by consumer. Meters: 140; owned and repairs paid by consumer; controlled by city. Use of meters compulsory for all consumers. Hydrants, public, 45. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Bonded debt, $60,000, at 6%. Works are run in connection with electric light plant and finances are not kept separate. MANAGEMENT.—Rept. by Cy. Clk., Chas. Wolf, July 20, '96. SEWERS.—None.

46. **HORTON,** Brown Co. (3,816.) Built in '93 by A. H. McCormack, under name of Horton Water Co.; put in operation in '93. Engr., A. H. McCormack. FRANCHISE.—21 yrs. from '93; purchase of works by city optional at end of 10, 15 and 21 yrs. Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $3,000 per yr. for fire protection. No legal difficulties. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Not given. Iowa or Missouri bituminous coal used; av. cost, $2.50 per short ton. STAND-PIPE.—Cap., 125,000 galls.; iron, 12 × 150 ft., on stone foundation. DISTRIBUTION.—Mains, 5 miles; cost extensions met by Co. Taps, 100; made by Co. Services, iron; paid for by property owner; controlled by Co. and owner; repairs paid by Co. Use of meters optional with consumer. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Bonded debt, $50,000, at 6%; sinking fund, none. Revenue: City, fire protection, $3,000. No deficits. MANAGEMENT.—Prest., A. H. McCormack; Secy., Lee Clark, both of Parsons; Supt., R. H. Fox. Rept. by W. H. Kemper, Dec. 14, '96. SEWERS.—Has storm sewers only.

47. **HUTCHINSON,** Reno Co. (8,682.) Built in '86 by Water, Light & Telephone Co.; now known as Hutchinson Water, Light & Power Co. Press rept., Oct., '96, stated stockholders had turned plant over to bondholders. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city at end of franchise. If not purchased the franchise is to be renewed. Rates are not subject to regulation by city; max. rates fixed in franchise. Co. is not exempt from local taxes. City to pay $12,600 per yr. for hydrant rental. City at present is unable to make payments under its contract. Press rept., Mar., '97, stated Co. and city were arranging compromise, providing for reduction of rates for both public and private service. No legal difficulties. SUPPLY.—Open and driven wells, pumping direct. PUMPS.—Cap., 4,000,000 (?) galls.; 500,000 (makers rept. 2,500,000) Holly-Gaskill hor. high duty; 1,500,000 Holly hor. dup. Bituminous slack used; av. cost, $2 per short ton. FISCAL YEAR CLOSED July 31, '95. DISTRIBUTION.—Mains, 16 miles. Taps, about 400; made by Co. at $2.50 for ½-in., $3 for ¾-in., $4 for ¾-in. and $5 for 1-in. Services, galv. i. and lead; paid for by consumer. Meters, about 200; owned by Co. and consumers; controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Meters are being introduced as fast as possible. Hydrants, public, 185; private, 3. CONSUMPTION.—(Galls.) av., 600,000; max., 1,500,000; min., 400,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Works were constructed and are run in connection with electric light plant; figures cannot be given separately. MANAGEMENT.—Secy. and Treas., Thos. R. Beebe. Rept. by Supt., L. A. Beebe, July, 24, '96. SEWERS.—Has sanitary sewers only.

48. **INDEPENDENCE,** Montgomery Co. (3,127.) Built in '85 by Co. See note. FRANCHISE.—20 yrs. from '85. Rates are regulated by franchise. Co. is not exempt from local taxes. SUPPLY.—Verdigris River, pumping to tank and direct. PUMP.—Cap., 750,000 Smith-Vaile single. Bituminous coal used; av. cost, $2.20 per short ton, delivered. FILTERS.—Cap., 750,000 galls.; American (New York). TANK.—Cap., 100,000 galls.; steel, 24 × 30 ft., on sandstone tower 80 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by surplus. Taps, 300; made by consumer; no fee. Services, galv. i. or lead; paid for by consumer. Meters, 5; owned and repairs paid by consumer; controlled by Co.; Co. can compel use of meters and any consumer may have one. Hydrants, public, 59. CONSUMPTION.—(Galls.) av., 250,000; min., 100,000. PRESSURE.—Ordinary, 45 lbs.; fire, 150 lbs. FINANCIAL. — Cost, about $75,000. Expenses, Operating, $2,400; taxes, $900. Revenue, $6,470: Consumers, unmetered, $2,700; metered, $200; City, fire protection, $3,450; street sprinkling, $120. MANAGEMENT.—Treas., W. H. Wesson, Springfield, Mass.; Ch. Pump. Engr., F. M. Gordon. Rept. by Supt., A. G. Harper, June 6, '96. SEWERS.—None. NOTE.—Works were built by Independence Water Co. July, '91, Supt. Harper rept. Co. was defunct, mortgage having been foreclosed. In '95 works were owned by Southern Kansas Water Co. Press repts. state: May, '96, city took forcible possession of works, alleging poor water and deficient pressure. Aug., '96, city began suit to annul franchise. Jan., '97, U. S. Circuit Court refused to remand case to local court and appointed Supt. Harper for the Co., and W. H. Whitford, former Supt., for city, as joint receivers.

49. **JUNCTION CITY,** Geary Co. (4,502.) Built in '87 by city. SUPPLY.—Driven wells, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane. Bituminous slack used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 500,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by general fund. Taps, 400; made by city. Meters, 40; owned by consumers and city; controlled by city. Use of meters optional with consumer. Hydrants, public, 67. CON-

SUMPTION.—(Galls.) av., 125,000. PRESSURE.—Ordinary, 85 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $75,000 to $80,000. Bonded debt, $50,000, at 6%. Expenses, $5,200: Operating, $2,200; int., $3,000. Revenue, $5,400: Consumers, $4,200; City, fire protection, $900; street sprinkling, $300. MANAGEMENT.—Supt. and Pump. Engr., C. F. Wisler. Rept. by T. W. Dorn, June 15, '96. SEWERS.—Has storm sewers only.

50. **KANSAS CITY**, Wyandotte Co. (38,316.) Present plant is owned by Metropolitan Water Co. First supplied from Co. at Kansas City, Mo, whose works were bought by that city in '95 or '96. FRANCHISE.—25 yrs. from '82; does not provide for purchase of works by city. Rates are not to be higher than in Kansas City, Mo. Co. is not exempt from local taxes. City to pay $50 for each fire hydrant, one to be located on each 500 ft. of main. SUPPLY.—Missouri River, pumping direct and to standpipe from settling reservoir. PUMPS.—Cap., 13,500,000 galls.; 7,500,000 comp. cond. and 3,000,000 double-acting Worthington; 2—1,500,000 Blake double-acting. Bituminous slack used; av. cost, $1.30 per short ton. SETTLING RESERVOIR.—Cap., 60,000,000 galls. STAND-PIPE.—100 ft. high. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 35 miles. Taps, 1,650; made by Co. at $2 for ¾-in., $2.75 for 1-in., $3.25 for 1¼-in., $4 for 1½-in. and $5 for 1-in. Services, lead or galv. i.; paid for by consumers. Meters, 350; owned by Co. and consumers; controlled and repaired by Co. Use of meters compulsory for manufacturers, liveries, laundries and office buildings. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 300; private, 50. CONSUMPTION.—(Galls.) av., 2,000,000; max., 3,000,000; min., 1,500,000. PRESSURE.—Ordinary, 100 lbs.; fire, 130 lbs. FINANCIAL.—Revenue, City, fire protection, $14,000. MANAGEMENT.—Prest., G. E. Taintor; Secy. and Treas., G. D. L'Hulier; Ch. Engr., Lee Riley. Rept. by Supt., G. B. Wing, June 17, '96. PROJECTED IMPROVEMENTS.—New station and 24 and 20-in. supply mains, under construction. SEWERS.—Has combined sanitary and storm sewers.

51. **KINGMAN**, Kingman Co. (2,390.) Built in '86-87 by Kingman Water & Power Co.; name changed in '89 to Kingman Water & Light Co. FRANCHISE.—30 yrs. from '90. Max. rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $3,270 per yr. for 56 hydrants. LEGAL DIFFICULTIES.—City sued for annulment of franchise in Feb., '95; case still in the courts. SUPPLY.—Open well and 60 2-in. driven wells, pumping to tank and direct.. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Gordon-Maxwell comp. dup.. Bituminous slack used; av. cost, $2 per short ton. TANK.—Cap., 70,000 galls.; steel, 20 × 30 ft., on timber trestle, 50 ft. high. DISTRIBUTION.—Mains, 5 miles. Taps, 120; made by Co. free. Services, ¾-in. iron; paid for by consumer. Meters, 12; owned and repairs paid by consumer; controlled by Co. Use of meters optional with consumer. Hydrants, public, 56. CONSUMPTION.—(Galls.) av., 1,000,000; max, 1,500,000; min., 100,000. PRESSURE.—Ordinary, 55 lbs.; fire, 85 lbs. FINANCIAL.—(In '90.) Cost, $42,500. Revenue, $4,500. MANAGEMENT.—Rept by Supt. and Ch. Pump. Engr., C. H. Thomas, June 7, '96. SEWERS.—None.

52. **KINSLEY**, Edwards Co. (771.) Built in '87-8 by town. SUPPLY.—Well, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls; Deane dup. STAND-PIPE.—Cap., 180,000 galls.; 16 × 120 ft. DISTRIBUTION.—(In '88.) Mains, 5 miles. Taps, 75. Meters, 0. Hydrants, 25. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—(In '88.) Cost, $40,000. Bonded debt, $40,000, at 6%. Revenue, consumers, $700. NOTE.—No rept. since '89-90 Manual.

53. **LANSING**, Leavenworth Co. (1,468.) Built in '84 by State of Kansas to supply Kansas State Penitentiary and village of Lansing. Convict labor used. SUPPLY.—Six 5-in. driven wells in old bed of Missouri River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; 500,000 Deane and 500,000 Hooker. Bituminous slack used; av. cost, 30 cts. per short ton. FILTERS.—Cap., 500,000 galls.; three 6-ft. Jewell. RESERVOIR.—Double, 86 ft. above point of distribution. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 2 miles. Taps, 40; made by State, free. Services, w. i.; paid for by consumer. Meters, 0. Any consumer may have meter. Hydrants, public, 9. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE. — Ordinary, 40 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, about $75,000. No debt. No separate account is kept of expenses or receipts. MANAGEMENT.—Directors of Penitentiary. Rept. by Ch. Pump. Engr., Dan. Storrs, Jan. 8, '97.

54. **LARNED**, Pawnee Co. (1,861.) Now owned by Larned Water Supply Co. (press rept.; see note). Built in '87 by R. L. Walker & Co., Topeka. FRANCHISE.—21 yrs. from '87; provides for purchase of works by city in '96, and at close of every 5 yrs. thereafter, at appraised valuation. Rates are fixed in franchise. SUPPLY.—Driven wells, pumping to stand-pipe. In '90 pumping station was removed from Pawnee to Arkansas River and system of driven wells put in to secure better water supply. PUMP.—Cap., 1,500,000 galls; Deane. STAND-PIPE.—Cap., 84,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 7.5 miles. Taps, 200. Meters, 7. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Supt., J. J. Nesbit. NOTE.—Inquiry sent to Co. was returned endorsed, "No changes made since last reported in the Manual." Press rept. states Larned Water Supply Co. was incorp. July, '96, with authorized capital of $33,700; directors, G. W. Currier, Nashua, N. H.; C. T. Sim, Wichita, and others.

55, 56. **LAWRENCE**, Douglas Co. (9,997.)

KANSAS WATER AND LIGHT CO.

Organized in '89 to operate works at Lawrence and Paola. Receiver appointed in '94, on account of complications growing out of disagreements between City of Lawrence and Co. FINANCIAL.—(In '89.) Cost, $350,000. Cap. Stock, $300,000; all paid-up. Bonded debt, $255,000 at 6%. Sinking fund, 2% after 10 yrs. Expenses, $20,700: Operating, $5,400; int., $15,300. Revenue, $28,091; Consumers, unmetered, $15,135; City, $9,112. NOTE.—No rept. since '90-1 Manual.

LOCAL PLANT.

Built in '86 by City Water Co. See note. SUPPLY.—Kansas River, pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington, a comp. non-cond. and a simple high pressure. FILTERS.—Cap., 1,000,000 galls.; two National. SETTLING RESERVOIR.—Cap., 6,000,000 galls. in three compartments. STAND-PIPE.—Cap., 240,000 galls.; 20 × 105 ft. DISTRIBUTION.—Mains, 18 miles. Taps, 516. Meters, 21. Hydrants, 150. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—See above. NOTE.—No rept. since '90-1 Manual. Press repts. state city withheld hydrant rentals from July, '89, to Jan., '92, and that in '92 Co. sued to secure same. In '93, compromise was rept., Co. to make various improvements. Apr. 30, '95 (press rept.), Lawrence Water Co. was incorp. in Maine; cap. stock, $200,000, with $500 paid in; Prest., Wm. C. Eaton; Treas., Edw. D. Noyes, both of Portland.

57. **LEAVENWORTH**, Leavenworth Co. (19,768.) Built in '82 by Leavenworth City & Fort Leavenworth Water Co. FRANCHISE.—20 yrs. from '82; provides for purchase of works by city after 20 yrs. Rates are regulated by city ordinance. Co. is not exempt from local taxes. City to pay $75 per yr. per hydrant. No legal difficulties. SUPPLY.—Missouri River, pumping to settling basins and repumping to reservoir. PUMPS.—4,000,000 galls.; Holly-Gaskill; 6,000,000 Worthington vert. comp. high duty; Great Western. Leavenworth coal used. RESERVOIRS.—Cap., 27,000,000 galls.; three settling and one distributing basin. DISTRIBUTION.—Mains, 27 miles. Taps, 1,440; made by Co. Services, galv. i. and lead; paid for by consumer. Meters: 450; owned and repairs paid by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 133. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 125 lbs.; fire, 140 lbs. FINANCIAL.—Not given. MANAGEMENT.—Prest., Paul E. Havens; Secy. and Treas., W. T. Hewitt; Ch. Pump. Engr., Geo. W. Cunningham. Rept. by Supt., J. H. Foley, June 4, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 3, '83.

—? **LYONS**, Rice Co. (1,754.) Built prior to '93 by city. Supply was deficient in '93. Cy. Clk., W. T. Nichols.

58. **M'PHERSON**, McPherson Co. (3,172.) Purchased and enlarged by Western Water & Electric Co.; built in '83 by city. FRANCHISE.—20 yrs. SUPPLY.—8-in. well, 130 ft. deep, pumping to stand-pipe and direct. PUMPS.—Cap., 680,000 galls.; Cook, deep well. Bituminous slack used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 93,000 galls.; steel, 12 × 110 ft. DISTRIBUTION.—Mains, 9 miles; cost extensions met by hydrant rental from city. Taps, about 300. Services, w. i.; paid for by consumer. Meters: 30; owned by consumers and Co. Cb. can compel use of meters and any consumer may have one. Hydrants, public, 55. PRESSURE.—Ordinary, 30 lbs.; fire, 80 lbs. FINANCIAL.—Cost, about $75,000. Cap. Stock, authorized, $100,000. Bonded debt, $50,000, at 6%. MANAGEMENT.—Rept. by Genl. Mgr., J. E. Wright, June 4, '96. SEWERS.—None. REFERENCE.—Eng. News, Apr. 18, '85.

59. **MANHATTAN**, Riley Co. (3,004.) Built in '87-8 by city. SUPPLY.—Driven wells in bed of Blue River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. Mindon nut coal used; av. cost, $2.90 per short ton delivered. RESERVOIR.—Cap., 750,000 galls. FISCAL YEAR CLOSED July 15. DISTRIBUTION.—Mains, 8 miles; cost extensions met by general fund. Taps, 250; made by city. Services, lead or galv. i.; paid for by city to curb. Meters: 51; owned, controlled and repairs paid by city; yearly rental, none. Use of meters optional with city. Hydrants, public, 49. CONSUMPTION.—No record kept. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, about $75,000. Bonded debt, $70,000, at 6%, due in 1908. Expenses, $6,500: Operating, $2,300; int., $4,200. Revenue, $3,252; Consumers, unmetered, $1,830; metered, $1,422. Int. raised by taxation. MANAGEMENT.—Ch. Pump. Engr., A. H. Johnson. Rept. by Supt., Lee Shaffer, July 8, '96. SEWERS.—None.

60. **MARION**, Marion Co. (2,047.) Built in '87 by Marion Water Supply, Electric Light & Power Co. FRANCHISE.—5 yrs. from '95; does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $40 per hydrant per yr. No legal difficulties. SUPPLY.—Wells and stream, pumping to stand-pipe and direct. PUMPS.—(In '89.) Cap., 2,000,000 galls.; 2—1,000,000 Volker & Felhousen. Bituminous nut coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 82,000 galls.; iron, 10 × 140 ft., on stone foundation. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Taps, 200; made by Co. for $6. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one by paying for it. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 100,000; max., 250,000; min., 25,000. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs.

FINANCIAL.—Cost, $75,000. Expenses, operating, $4,000. Revenue, $3,420: Consumers, unmetered, $2,000; City, fire protection, $1,320; street sprinkling, $100. MANAGEMENT.—Prest., Robt. T. Turner; Secy., Platt V. Bryan; both of Elmira, N. Y. Rept. by Treas. and Supt., Taylor Riddle, June 5, '96. SEWERS.—Has storm sewers only.

61. **MARYSVILLE,** Marshall Co. (1,913.) Built in '89 by Marysville Water Co. FRANCHISE.—20 yrs. SUPPLY.—Cook wells, near Blue River, pumping to stand-pipe. PUMPS.—Cap., 1,250,000 galls.; 750,000 comp. non-cond. and 500,000 simple high pressure Worthington. STAND-PIPE.—Cap., 59,000 galls.; 10 × 100 ft. DISTRIBUTION.—Mains, 4.5 miles. Meters, 60. Hydrants, 50. PRESSURE.—(In '89.) Ordinary, 87 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $40,000, at 6%. Revenue, Consumers, $3,800. MANAGEMENT.—Prest., M. J. Harrington, Kansas City, Mo. Rept. by Supt. and Mgr., A. A. Palmer, Oct. 15, '96.

62. **MEDICINE LODGE,** Barber Co. (1,095.) Built in '89-90 by city; operated by Eldred & Hinman. SUPPLY.—Spring, pumping direct; filtered. PUMPS.—Cap., 1,250,000 (?) galls.; two Knowles dup. rept. in '90. Makers also rept. 750,000 Worthington non-comp. non-cond. DISTRIBUTION.—(In '90.) Mains, 3 miles. Taps, 68. Hydrants, 21. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Cost, $35,000. Bonded debt, $35,000. Expenses, operating, $1,500. Revenue: Consumers, $1,000; City, none. NOTE.—No rept. since '90-1 Manual.

63. **MINNEAPOLIS,** Ottawa Co. (1,756.) Built in '87 by Minneapolis Water Co. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city at end of 20 yrs. Co. is not exempt from local taxes. SUPPLY.—Wells, connected by tunnel, pumping to stand-pipe and direct. PUMPS.—Cap., 1,750,000 galls.; two Blake, one comp., one high pressure, dup. Bituminous slack used; av. cost, $2.70 per short ton. STAND-PIPE.—Cap., 200,000 galls.; 20 × 85 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5½ miles. Taps, 350; made for $3. Meters: 25; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 52. PRESSURE.—Ordinary, 62 lbs.; fire, 125. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $100,000. Bonded debt, $68,000, at 6%. These figures include both water and electric light plants. MANAGEMENT.—Prest., C. E. Eddy, Boston, Mass.; Secy., J. C. Gafford; Treas., H. M. Plumes. Rept. by Supt. and Pump. Engr., C. E. Powell, Aug., '96. SEWERS.—None.

64. **NEWTON,** Harvey Co. (5,605.) Bought by city in '95 (press rept.); built in '84 by Newton Water Co. under perpetual franchise. Engr. for improvements in '92-3, Louis E. Hawes, Tremont Bldg., Boston. See note. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington non-cond., a comp. and a non-comp. FILTERS.—(In '89.) 67 × 10 ft. × 4 ft. high. RESERVOIR.—Cap., 10,000,000 (?) galls.; impounding. STAND-PIPE.—Cap., 400,000 galls.; iron, 30 × 76 ft., on 45-ft. masonry tower, about 20 ft. above city. DISTRIBUTION.—Mains, 15 miles. Taps, 400. Meters, 50. Hydrants, 112. PRESSURE.—Ordinary, 40 to 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $210,000. Cap. Stock, $200,000. Bonded debt, $158,000, at 6%. Expenses, operating, $4,000. Revenue: Consumers, $11,800; City, $6,720. NOTE.—No official rept. since '90-1 Manual. Press repts. state that: Plant was sold by order of court in '92; that in Oct., '94, Co. shut down plant, owing to failure of city to pay $3,450 back hydrant rental, and that city took possession of works, and notified Co. it would take steps to annul franchise unless works were improved and operated in accordance with franchise. In May, '95, city bought works (equity of ?) for $80,000. In June, '96, and Feb., '97, C. M. Glover, Cy. Clk., rept. that Fairbanks, Morse & Co., had been engaged to make plans for improvements, and that new supply would be brought from wells 7 miles from city, through 12-in. c. i. pipe. Mar. 15, '97, H. V. Hinckley, Topeka, rept. city had voted $65,000 of bonds for the proposed improvements. Chn. Water Com., P. M. Hoisington. REFERENCE.—Eng. News, May 30, '85.

65. **NORTON,** Norton Co. (1,074.) Built in '88 by city. SUPPLY.—Wagner wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; Deane and Olds, 500,000 each. Av. cost of coal used, $4 per short ton. STAND-PIPE.—Cap., 84,610 galls.; iron; 12 × 100 ft. DISTRIBUTION.—Mains, 8 miles; cost extensions met by city. Taps, 300; made by consumer for $5. Services, iron; paid for by consumer. Meters: 1; owned and controlled by city. Use of meters optional with city. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $35,000. Expenses, Operating, $1,800. MANAGEMENT.—Rept. by Ch. Pump. Engr., Erick Angland, Aug. 28, '96. SEWERS.—Has sanitary sewers.

66. **OBERLIN,** Decatur Co. (976.) Built in '88 by city. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMP.—Cap., 1,000,000 galls.; Gordon. Bituminous coal used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 84,610 galls.; iron; 12 × 100 ft., on stone foundation. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by city. Taps made by city for $12. Services, galv. i.; paid for by property owner. Hydrants, public, 26. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $30,000, at 6%; due in 1909. About 5% of deficit has been met by taxation. MANAGEMENT.—Prest., C. S. Maddox; Treas., W. E. Palmateer; Supt. and Ch. Pump. Engr., S. J. Morrish. Rept. by Secy., H. D. Colvin, July 3, '96. SEWERS.—None.

67. **OLATHE,** Johnson Co. (3,294.) Built in '84 by town. SUPPLY.—Surface water, gathered in impounding reservoir, pumping direct. PUMPS.—Cap., 750,000 galls.; Holly hor. dup. FILTER.—Cap., 150,000 galls.; Hyatt (New York). RESERVOIR.—Cap., 20,000,000 galls. DISTRIBUTION.—Mains, 6 miles. Meters, 3. Hydrants, 52. FINANCIAL.—Bonded debt, $35,000 at 7%. Expenses: Operating, $1,200. Revenue, $1,500. MANAGEMENT.—Chn. Water Com., Geo. B. Alger; Engr., C. O. Sylvester. Rept. by Mayor, A. E. Mott, Sept. 23, '96.

68. **OSBORNE,** Osborne Co. (1,174.) Built in '90 by city; put in operation in Aug. Engrs., G. W. Pearson & Son, Kansas City. Contrs., U. S. Wind Engine & Pump Co. SUPPLY.—Wells, pumping to tank and direct. PUMP.—Cap., 400,000 galls.; Knowles. Rich Hill (Mo.) bituminous coal used; av. cost, $4 per short ton. TANK.—On wood tower 80 ft. high. FISCAL YEAR CLOSED Mar. 15. DISTRIBUTION.—Mains, 4 miles; cost extensions met by taxation. Taps, 100; made for $10. Services, iron; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 60,000; max., 120,000; min., 10,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 6%; due in 1910. Expenses, $2,300: Operating, $1,100; int., $1,200. Revenue: Consumers, $800. Deficits are met by taxation. Rept. by F. Yoxall, June 10, '96. SEWERS.—None.

69. **OSWEGO,** Labette Co. (2,574.) Built in '87 by Oswego Water Supply Co.; now known as Oswego Water-Works Co. Works were in hands of receiver in '88; Co. reorganized in '90. FRANCHISE.—21 yrs. from '87. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $2,000 per yr. for public service. No legal difficulties. SUPPLY.—Neosho River, pumping direct. PUMPS.—A 3,000,000 Deane and a fire pump. Bituminous slack used; av. cost, $1 per short ton. FILTERS.—Cap., 950,000 galls.; New York, 500,000; Jackson, 450,000. FISCAL YEAR CLOSED June 30, '95. DISTRIBUTION.—Mains, 5¼ miles. Taps, 150; made by Co., free. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 300,000; max., 450,000; min., 200,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, about $70,000. Cap. Stock: Authorized, $50,000; all paid-up; paid no div'd in '95. Pref'd: Authorized, $20,000; all paid-up; no div'd guaranteed. No debt. Expenses, $1,800: Operating, $1,500; taxes, $300. Revenue, $4,500: Consumers, $2,500; City, fire protection, $2,000. The surplus in '95 was used for new filter. MANAGEMENT.—Prest. and Supt., O. W. Ball; Ch. Pump. Engr., Orrin Kettlewell. Rept. by Secy. and Treas., D. Jennings, June 5, '96. SEWERS.—None.

70. **OTTAWA,** Franklin Co. (6,248.) Built in '86 by C. T. Ewing, of Thayer; transferred in '92 to Ottawa Fire (?) & Light Co. FRANCHISE.—21 yrs. from '87; does not provide for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. City receives water for schools, churches and watering troughs free. No legal difficulties. SUPPLY.—Marais des Cygnes River and well, pumping to stand-pipe and reservoirs. PUMPS.—Cap., 1,500,000 galls.; two Deane, one comp., one high-pressure. Weir City coal used; av. cost, $2 per short ton. FILTERS.—Cap., 450,000 galls.; sand and gravel. RESERVOIRS.—Cap., 1,000,000 galls.; 2—500,000. STAND-PIPE.—Cap., 73,000 galls.; steel; 10 × 125 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 12 miles; cost extensions met by revenue of plant. Taps made by Co. Services, iron and lead; paid for by property owners. Meters, 8; owned and repairs paid by property owners; controlled by Co. Use of meters optional with consumer; compulsory for various consumers. Hydrants, public, 84; private, 4. CONSUMPTION.—(Galls.) av., 450,000. PRESSURE.—Ordinary, 60 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $100,000. Expenses: Taxes, $600. Revenue: City, fire protection, $3,100; sewer flushing, free. MANAGEMENT.—Ch. Pump. Engr., M. H. Blair. Rept. by Supt., J. W. Pollock, Sept. 28, '96. SEWERS.—Has sanitary and storm sewers.

71. **PAOLA,** Miami Co. (2,943.) Built in '85-6 by Paola Water Co. See note. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city at expiration. No legal difficulties. SUPPLY.—Bull Creek, pumping from impounding reservoir to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington non-cond., a comp. and a non-comp. Bituminous slack coal used; av. cost, 95 cts. per short ton, delivered. FILTERS.—Cap., 250,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 90,000 galls.; steel; 12½ × 100 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 200; made by consumer, no fee. Services, galv. i.; paid for by property owner. Meters, 6; owned, controlled and repairs paid by Co. Use of meters compulsory for R. Rs. Co. can compel use of meters and any consumer may have one. Hydrants, public, 58. CONSUMPTION.—(Galls.) max., 600,000; min., 300,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $76,000. MANAGEMENT.—Prest., W. G. Pine Coffin, 44 Wall St., New York, N. Y.; Ch. Pump. Engr., Jno. M. Baker. Rept. by Mgr., E. W. Robinson. NOTE.—In '89, Kansas Water & Light Co. (see Lawrence) was organized to operate works at Lawrence and Paola. Press repts. state Paola plant was sold under execution Nov., '95, for $27,000, two-thirds of appraised valuation. SEWERS.—None.

72. **PARSONS,** Labette Co. (6,736.) Built in '83 by Parsons Water Co.; now Par-

sons Water Supply & Power Co. Works rebuilt in '92. FRANCHISE.—30 yrs. from '92; provides for purchase of works by city every 5 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $5,450 per yr. for 99 hydrants and $50 for each additional one. No legal difficulties. SUPPLY.—Labette Creek and Neosho River, pumping to stand-pipe and direct. PUMPS.—Cap., 8,000,000 galls.; 2,500,000 comp. dup. for high service; 2,000,000 comp. dup. for low service, and 1,500,000, all Deane, and two Smith-Valle; comb. cap., 2,000,000. FILTERS.—Cap., 2,000,000 galls.; Jewell gravity. Filter gallery formerly used. RESERVOIR.—Cap., 2,500,000 galls. STAND-PIPE.—Cap., 376,000 galls.; steel; 20 × 160 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 20.3 miles; cost extensions met by surplus earnings. Taps, 627; made by consumer, no fee. Services, galv. i. or lead; paid for by property owner. Meters, 120; owned by consumer; controlled and repairs paid by Co. Use of meters compulsory for R. Rs. Co. can compel use of meters and any consumer may have one. Hydrants, public, 99; private, 2. CONSUMPTION.—(Galls.) av., 600,000; max., 1,000,000; min., 300,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $225,000. Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $165,000, at 6%; due in 1922. Sinking Fund, to commence in 1900. Expenses, $15,079: Operating, $4,866; int., $9,900; taxes, $313. Revenue, $17,435: Consumers, unmetered, $5,560; metered, $6,250; City, fire protection, sewer flushing and public buildings, $5,450; street sprinkling, $175. Surplus used in extensions thus far. MANAGEMENT.—Secy. and Supt., W. K. Hayes; Ch. Pump. Engr., Peter Lowe. Rept. by Prest., C. H. Kimball, June 9, '96. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, Dec. 29, '83; Jewell filters, May 28, '96.

73. **PEABODY,** Marion Co. (1,474.) Built in '86 by town. SUPPLY.—Five wells, one pumped with a 22-ft. windmill, other four with steam pumps, pumping to tank. PUMP.—Cap., 144,000 galls.; Knowles. Bituminous coal used; av. cost, about $4 per short ton. TANK.—Cap., 60,000 galls.; wood; on 60-ft. tower 100 ft. above town. FISCAL YEAR CLOSED Mar., '96. DISTRIBUTION.—Mains, 1½ miles. Taps made by city for $4.50. Services, ¾-in.; paid for by property owner. Meters, 0. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 15,000; max., 30,000; min., 3,000. PRESSURE.—(In '89.) Ordinary, 55 lbs.; fire, 70 lbs. FINANCIAL.—Cost, "less than" $20,000. Bonded debt, $15,000, at 6%. Sinking Fund, $2,000, $1,400 invested in farm loans at 6½ and 7%. Revenue: Consumers, about $500. Receipts from private revenue pay running expenses and repairs. Tax levy of 2 mills on low valuation of property is made for sinking fund. MANAGEMENT.—Supt., City Marshall. Rept. by Cy. Clk., W. H. Morgan, June 5, '96. SEWERS.—None.

74. **PHILLIPSBURGH,** Phillips Co. (992.) Built in '90 by city. SUPPLY.—Wells, pumping to tank and direct. PUMPS.—Cap., 500,000 galls.; 2—250,000 Deane. Bituminous slack used; av. cost, $2 to $4 per short ton. TANK.—Cap., 58,000 galls.; wood, on wooden trestle 60 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by appropriations from city funds. Taps, 97; made by city. Services, galv. i.; paid for by consumer. Meters, 7; owned and repairs paid by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 25; private, 1. CONSUMPTION.—(Galls.) av., 35,000; max., 40,000; min., 30,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, about $30,000. Expenses: Operating, about $800. Revenue, $1,000: Consumers, unmetered, $900; metered, $100. Rept. by E. E. Brainerd, May 5, '96.

75. **PITTSBURGH,** Crawford Co. (6,697.) Built in '85 by Pittsburgh Water & Irrigating Co. FRANCHISE.—21 yrs. Rates are fixed in franchise. SUPPLY.—Artesian wells, pumping to tank and direct. PUMPS.—Cap., 2,750,000 galls.; two Deane, a comp. dup. and a dup. Makers also rept. 1,000,000 Worthington non-comp. non-cond., and 12 × 16-in. Rand air compressor for air-lift, shipped Sept., '94, for use here. TANK.—Cap., 67,000 galls.; 24 × 20 ft. DISTRIBUTION.—Mains, 15 miles. Meters, 50. Hydrants, public, 108. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Treas., E. O. Emerson. Supt., W. G. Seabury.

76. **PLEASANTON,** Linn Co. (1,139.) Built in '84 by town. SUPPLY.—Artificial lake, pumping to reservoir. PUMP.—Wind power, steam in reserve. FILTERS.—Sand and gravel. RESERVOIR.—Cap., 160,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 65. Hydrants, 28. FINANCIAL.—Cost, $17,000. Bonded debt, $14,000: $9,000 at 7%, $5,000 at 6%; due in annual payments of $1,000. Expenses, $1,080: Operating, $100; int., $930. Revenue: Consumers, $700. NOTE.—No rept. since '90-1 Manual.

77. **PRATT,** Pratt Co. (1,418.) Built in '86 by city. No further information.

78. **SALINA,** Saline Co. (6,149.) Built in '83 by Salina Water-Works Co.; reorganized in '93 under laws of Maine. FRANCHISE.—20 yrs. from '83; provides for purchase of works by city any time after '93; failure to buy extends hydrant contract to 1923. Rates are fixed in franchise. SUPPLY.—Gang wells and conduit to Smoky Hill River for emergency, pumping direct. Unsigned rept., Jan., '97, stated driven wells would be put down and 1,500,000-gall. pump added. PUMPS.—Cap., 2,000,000 galls.; 1,500,000 Holly-Gaskill hor. high duty; 500,000 Holly. DISTRIBUTION.—Mains, 10 miles. Services, galv. i. Hydrants, public, 76. PRESSURE.—(In '90.) Ordinary, 20 lbs.; fire, 80 lbs. FINANCIAL.—Cost (in '87), $102,000. Cap. Stock, $100,000. Bonded debt,

$100,000. MANAGEMENT.—Rept. by Prest., C. H. Payson, Portland, Me., Dec., '95, and Supt., Jno. L. Bishop, July, '96. REFERENCE.—Eng. News, Oct. 13, '83.

79. **SENECA,** Nemaha Co. (2,032.) Built in '96 by city; put in operation in Mar. Engr., F. L. Burrell, Lincoln, Neb. Contr., Jas. T. Broughal, Kansas City. SUPPLY.—Well, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; Snow. Weir City (Kan.) coal used; av. cost, $2.75 per short ton. STAND-PIPE.—Cap., 85,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 6 miles. Taps, 40; made by city for $10, including service to curb. Services, iron; paid for by consumer. Meters: 40; owned and repairs paid by consumer; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 40. PRESSURE.—Ordinary, 50 lbs.; fire, 180 lbs. FINANCIAL.—Cost, $35,000. Bonded debt, $30,000, at 6%, due in 30 yrs. Deficits are met by general taxation. MANAGEMENT.—Supt., D. R. Vorhes; Ch. Pump. Engr., B. Murphy. Rept. by Jas. H. Gleason, Feb. 18, '97. SEWERS.—None.

80. **SMITH CENTRE,** Smith Co. (767.) Built in '89-90 by city. SUPPLY.—Beaver Creek, pumping direct and to stand-pipe. PUMPS.—Buffalo. STAND-PIPE.—Cap., 64,000 galls.; 10 × 110 ft. DISTRIBUTION.—Mains, 9 miles. Taps, 73. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $28,000. Debt, bonded, $25,000, at 6%, due in 1909. Expenses, $1,500. Revenue, $414. MANAGEMENT.—Mayor, J. R. Burrow; Cy. Clk., A. S. Kingsbury; Supt., C. C. Burr.

81. **SPRINGFIELD,** Seward Co. (Township, 347.) Bought in '89 by city; built in '88-9 by Springfield Light, Heat & Water Co. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 6,300 galls.; driven by 24-ft. windmill. TANK.—Cap., 110,000 galls. DISTRIBUTION.—Mains, 2½ miles. Rept. by citizen, July 25, '96. SEWERS.—None.

82. **STERLING,** Rice Co. (1,642.) Built in '87 by city. SUPPLY.—Thirty-eight driven wells, pumping direct. PUMPS.—Cap., 1,000,000 galls.; two Deane. Bituminous slack coal used; av. cost, $2.35 per short ton. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains: Cost extensions met by direct tax. Services, galv. i.; paid for by consumers. Meters, 0. Use of meters compulsory for steam boilers, hotels and livery stables. City can compel use of meters and any consumer may have one. Hydrants, public, 42. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 20 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $35,000, at 6%, due in 1906. MANAGEMENT.—Clk., E. C. Wickersham; Chn. W.-Wks. Comrs., W. B. Graham; Engr., A. Olmstead. Rept. by Mayor, Hamilton Irish, June 5, '96. SEWERS.—None.

83. **STOCKTON,** Rooks Co. (880.) Built in '87 by town. SUPPLY.—Three driven wells, pumping to stand-pipe and direct. PUMP.—Cap., 500,000 galls.; Deane comp. dup. Av. cost of coal used, $4 per short ton. STAND-PIPE.—Cap., 80,000 galls.; iron, 12 × 100 ft., on elev. of 86 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4½ miles. Taps, 91; made by city plumber, annual license $12.50. Services, ¾-in. i.; paid for by property owner. Meters: 50; owned, controlled and repairs paid by city. Use of meters optional with city; compulsory for livery stables and R. R. Hydrants, public, 28; private, 120. FINANCIAL.—Cost (in '90), $40,000. Bonded debt, $46,000: $33,000 at 5%, due in 1907; $13,000 at 7%, due in 1908. Sinking Fund, $600. MANAGEMENT.—Rept. by Cy. Clk., F. A. Chipman, Aug. 14, '96. SEWERS.—Has storm sewers only.

84. **TOPEKA,** Shawnee Co. (31,007.) Built in '81-2 by Topeka Water Co.; rebuilt in '90 and reorganized once or twice since '90. See Note. FRANCHISE.—20 yrs. from '81; provides for purchase of works by city at end of 20 yrs. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $46.66⅔ per hydrant per yr. for 147 and $50 for each additional one. LEGAL DIFFICULTIES.—About meaning of ordinance as to extensions; not settled. Press repts. stated local court had decided, in Oct., '96, that city had not authority to order mains extended to outlying districts; also that in Jan., '97, city had begun quo warranto proceedings to have franchise annulled. SUPPLY.—Open and driven wells, pumping direct. PUMPS.—Cap., 12,000,000 galls.: 4,000,000 and 5,000,000 Holly-Gaskill hor. high duty; 2—1,500,000 Holly quadruplex. Pittsburg bituminous slack used; av. cost, $1.85 per short ton. DISTRIBUTION.—Taps, 2,240; about 2,000 in use; made by Co., free. Services, lead and iron; paid for by consumer. Meters: 127; owned, 118 by Co., 9 by consumers; controlled by Co.; repairs made by Co., paid for by owner. Use of meters compulsory for hotels, liveries, flats and mills. Co. can compel use of meters and any consumer may have one. Hydrants, public, 320; private, 1 (owned by Co.). PRESSURE.—Ordinary, 80 lbs.; fire, 120 to 140 lbs. MANAGEMENT.—Receiver, Elias Summerfield; Ch. Pump. Engr., M. J. Zollinger. Rept. by Mgr. and Supt., Jesse Shaw, Oct. 31, '96. NOTE.—Receiver was appointed Feb. 12, '94. May, '96, works were sold at auction to bondholders for $525,000 (press rept.), plant being mortgaged for $1,000,000. Aug., '96, Topeka Water Co. was incorp. in New Jersey, with authorized cap. stock of $1,500,000. Press rept., Jan., '97, stated that W. B. Strong mortgage for $200,000 was prior to lien under which property was sold. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 20, '83.

85. **UDALL,** Cowley Co. (338.) Built in '88 by village. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 150,000 galls.; windmill. TANK.—Cap., 35,000 galls. DISTRIBUTION.—Mains, 2.5 miles. Taps, 16. Meters, 4. Hydrants, 7. PRESSURE.—(In '88.)

Ordinary, 125 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $6,500, at 6%. NOTE.—No rept. since '90-1 Manual.

86. **VALLEY FALLS,** Jefferson Co. (1,180.) Built in '88 by city. SUPPLY.—Two 116 × 30-ft. wells, pumping to tank. PUMPS.—Cap., 18,000 galls. TANK.—Cap., 70,000 galls.; 20 × 30 ft., on 35-ft. stone tower, 105 ft. above main street. DISTRIBUTION.—Mains, 2 miles. Taps, 25. Hydrants, 15. FINANCIAL.—Cost, $15,000. Bonded debt, $15,000, at 5%. NOTE.—No rept. since '90-1 Manual.

87. **WEIR,** Cherokee Co. (2,138.) Built in '89 by Weir City Water-Works Co. FRANCHISE.—25 yrs., with privilege of renewal. SUPPLY.—Artesian well, pumping to reservoir and direct. PUMP.—Cap., 750,000 galls.; Smith & Valle. RESERVOIR.—75 × 16 ft. DISTRIBUTION.—Mains, 2.5 miles. Taps, 78. Hydrants, 18. FINANCIAL.—(In '88.) Withheld. NOTE.—No rept. since '90-1 Manual.

88. **WELLINGTON,** Sumner Co. (4,391.) Built in '84-5 by Wellington Water Co. In '91 works were owned by former bondholders under name of Wellington Water-Works Co. In '95, city refused to pay hydrant rental for first half of year and Co. shut down plant. City seized plant and operated it (until Jan., '97, press rept.). City brought suit to annul franchise and apparently was successful. Press repts. state receiver was appointed in Aug., '96; that plant was sold at foreclosure on $60,000 mortgage on Nov. 11, '96, being bid in by bondholders for $33,500; and that on Jan. 8, '97, city turned plant over to special master of U. S. Court. FRANCHISE.—Gives city option of buying works in '94, and every 5 yrs., price to be determined by agreement or appraised. SUPPLY.—Slate Creek, pumping from settling reservoir to tank, stand-pipe and direct; filtered. PUMPS.—1,000,000 Worthington comp. cond. and one Smith-Valle high pressure. FILTERS.—Downward filtration through sand and gravel. STAND-PIPE.—Cap., 385,000 galls.; steel; 25 × 105 ft. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Services, lead; paid for by Co. to curb. Use of meters optional with consumer. Hydrants, public, 72. FINANCIAL.—Cap. Stock, paid-up, $100,000. Bonded debt, $60,000, at 4%. MANAGEMENT.—Secy., A. L. Chester; Treas., Chas. T. Hopkins. Rept. by Prest., Chas. Perry, Westerly, R. I., July 13, '96.

89. **WICHITA,** Sedgwick Co. (23,853.) Built in '82 by Wichita Water Co.; controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—21 yrs., provides (press rept.) for purchase of works by city. Max. rates are fixed in franchise. SUPPLY.—Driven wells, pumping direct. PUMPS.—Cap., 14,500,000 galls.; 5,000,000 Holly-Gaskill hor. high duty, 3,000,000 Gordon, 1,000,000 Deane, 2—1,500,000 Walker, 2—1,250,000 Smith-Valle. DISTRIBUTION.—Mains, 38 miles. Hydrants, public, 224. PRESSURE.—Ordinary, 50 lbs.; fire, 80-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy. and Treas., J. F. Cockburn; Supt., F. D. Aley. Rept. by American Water-Works & Guarantee Co., Pittsburg, Pa., Aug. 20, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Aug. 25, '83.

90. **WINDOM,** McPherson Co. (165.) Built in '88 by city. SUPPLY.—Well, pumping to a tank. PUMP.—Cap., 150,000 galls.; Curtiss windmill. TANK.—Cap., 40,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 9. Hydrants, 3. FINANCIAL.—Cost, $5,000. Debt, $5,900, at 6%. Revenue: Consumers, $200. NOTE.—No rept. since '90-1 Manual.

91. **WINFIELD,** Cowley Co. (5,184.) Built in '83 by Winfield Water Co.; re-organized in Maine in '93. FRANCHISE.—99 yrs. from '83; hydrant contract, 21 yrs. from '83. Franchise provides for purchase of works by city in '93, and at intervals of 5 yrs. thereafter. Rates are fixed in contract. LEGAL DIFFICULTIES.—(Press repts.) Jan., '92, jury in local court gave Co. verdict for $1 in suit for $2,400 hydrant rental, city claiming Co. had failed to furnish pure water. Supreme Court affirmed decision. SUPPLY.—Walnut River, pumping to settling basins, then filtered, and repumped to reservoir. PUMPS.—Cap., 2,250,000 galls.; 1,000,000 and 1,250,000 Worthington comp. non-cond. FILTERS.—Cap., 1,000,000 galls.; Warren (rept. by makers as installed in '94). A 1,000,000 Olyphant was rept. in '89. RESERVOIR.—Cap., 2,000,000 galls.; one mile from, 112 ft. above Main St. DISTRIBUTION.—Mains, 10 miles. Taps, 400. Meters (in '90), 12. Hydrants, 75. PRESSURE.—(In '88.) Ordinary, 53 lbs.; fire, 120 lbs. FINANCIAL.—Cap. Stock, $100,000. Bonded debt, (in '96), $75,000, at 6%; due in 1903. MANAGEMENT.—Supt., T. B. Meyers. Rept. by Prest., C. H. Payson, Portland, Me., Dec, '95. REFERENCE.—Eng. News, Oct. 24, '85; Warren filters, Jan. 4, '94, illustrated.

NEBRASKA.

1. **AINSWORTH,** Brown Co. (733.) Built in '90 by village. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMP.—Cap., 400,000 galls.; Smedley dup. STAND-PIPE.—Cap., 41,000 galls.; 10 × 70 ft. DISTRIBUTION.—Mains, 1.8 miles. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 37 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $8,692. Bonded debt, $8,000, at 6%. MANAGEMENT.—Rept. by Clk., W. H. Williams, Sept. 26, '96.

2. **ALBION,** Boone Co. (926.) Built in '87 by town. SUPPLY.—Well, pumping to tank and direct. PUMPS.—Cap., 575,000 galls.; Knowles dup. Av. cost of coal used, $3.50 per short ton. TANK.—Cap., 60,000 galls.; on trestle, 20 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by taxation. Taps, 40; made by licensed plumbers. Services, ¾-in. galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 15,000; max., 30,000; min., 10,000. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Bonded debt, $6,000, at 7%. Sinking Fund, $500. Expenses, $1,050: Operating, $600; int., $450. Deficits are met by general taxation. MANAGEMENT.—Prest., M. B. Boardman; Cy. Clk., F. A. Doty. Rept. by Supt. and Ch. Pump. Engr., W. G. Patton, June 5, '96. SEWERS.—None.

3. **ALLIANCE,** Boxbutte Co. (829.) Built in '94 by city; put in operation in Aug. Engr., A. A. Richardson; Contrs., Pomerine & Cooper; all of Lincoln. SUPPLY.—Well, pumping to stand-pipe. STAND-PIPE.—Cap., 93,000 galls.; steel, 12 × 110 ft. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by taxation. Taps, 112; made by city for $14. Services, ¾-in. w. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 75,000; max., 100,000; min., 50,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, about $16,000. Bonded debt, $16,000, at 6%; due in 1914. Expenses, $2,160: Operating, $1,200; int., $960. Revenue, $1,500. Deficits are all met by general taxation. MANAGEMENT.—Rept. by Water Comr., H. C. Kennedy, Nov. 20, '96. SEWERS.—None.

—? **ANSLEY,** Custer Co. (Township, 750.) Built in '98 by village. SUPPLY.—Creek, pumping by mill. FISCAL YEAR CLOSED May 5. FINANCIAL.—Cost, about $10,000 or $12,000. Bonded debt, $4,000. MANAGEMENT.—Prest., E. H. Butler; Treas., C. J. Sterns. Rept. by Clk., J. A. Ammerset. SEWERS.—None.

4. **ASHLAND,** Saunders Co. (1,601.) Built in '87-8 by village. SUPPLY.—Two 8-in. × 75 ft. wells, pumping to tank and direct. PUMPS.—Cap., 360,000 galls.; 180,000 Deane, and 180,000 Cook, deep well. Iowa nut bituminous coal used; av. cost, $2.50 per short ton. TANK.—Cap., 67,680 galls.; wood; 24 × 20 ft., on wooden tower 24 ft. high, located on hill. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 5 miles. Taps, 210; made by city at $2.75 for ½-in.; $3.25 for ⅝-in.; $4 for ¾-in.; $4.50 for ⅞-in. and $5 for 1-in. Services, lead and iron; paid for by consumer. Meters: 4; owned, 2 by city, 2 by consumers; controlled by city. City can compel use of meters and any consumer may have one. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 54,000; max., 144,000; min., 25,000. PRESSURE.—Ordinary, 55 lbs.; fire 100 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $19,000, at 7%; due in 1908. Expenses: Operating, $1,500. Revenue: Consumers, $1,500. MANAGEMENT.—Mayor, G. W. Meredith. Rept. by Supt. and Pump. Engr., A. C. Urch, June 27, '96. SEWERS.—Has private system of sanitary sewers.

5. **ATKINSON,** Holt Co. (701.) Built by city; put in operation Jan. 1, '91. SUPPLY.—Five open wells, pumping to stand-pipe (and direct?). Since last Manual system has been changed from Godfrey wells. PUMP.—Cap., 500,000 galls.; Smedley. STAND-PIPE.—Cap., 44,000 galls.; 10 × 75 ft. DISTRIBUTION.—(In '90.) Mains, ½ mile. Hydrants, 7. PRESSURE.—Ordinary, 30 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cost, $7,000. MANAGEMENT.—Rept. by Mayor, J. C. Brook.

6. **AURORA,** Hamilton Co. (1,862.) Built in '88-9 by town. SUPPLY.—Wells, pumping to reservoir, stand-pipe and direct. PUMPS.—Cap., 750,000 galls.; Deane; also two Cook deep-well. RESERVOIR.—Cap., 93,000 galls. STAND-PIPE.—Cap., 61,000 galls.; iron; 10 × 105 ft. DISTRIBUTION.—Mains, 4.3 miles. Taps, 166. Meters, 0. Hydrants, 28. FINANCIAL.—Cost, $34,000. Bonded debt, $34,000, at 6%; due in 20 yrs. Expenses, $3,879: Operating, $1,839; int., $2,140. Revenue: Consumers, $2,486. NOTE.—No rept. since '90-1 Manual.

P 1. **BANCROFT,** Cuming Co. (344.) Bids for $5,000 of 6% 20-yr. bonds, with option of call after 5 yrs., were to be received Mar. 15, '97; proceeds to be used for works. Chn. Trustees, D. W. Burke. Village Clk., J. J. Elkin.

F 1. **BARTLEY,** Red Willow Co. (220.) Built by village in '95 for fire protection. Contr., W. M. Hamilton. Supply, well, pumping by windmill to 10,000-gall. wood tank, on 40-ft. tower. Hydrants, 5. Rept. by Vill. Clk., Wm. Smith, June 15, '96.

7. **BEATRICE,** Gage Co. (13,836.) Built in '86 by city. SUPPLY.—Blue River, pumping direct. Rept. in Feb., '97, that filter plant was proposed. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly-Gaskill hor., a high duty and rotative. Av. cost of coal used, $2.45 per short ton. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 18 miles; cost extensions met by rentals and tax levy. Taps, 700; made by city for $9.50. Services paid for by property owner. Meters, 0. Hydrants, public, 115. PRESSURE.—Ordinary, 55 lbs.; fire, 120 lbs. FINANCIAL.—Cost (in '90), $90,000. Expenses: Operating, $7,500. MANAGEMENT.—Rept. by Comr., S. K. Davis, July 9, '96. SEWERS.—Has sanitary and storm sewers.

8. **BLAIR,** Washington Co. (2,069.) Built in '86 by town. SUPPLY.—Driven wells, 115 ft. deep to rock, pumping to reservoir. PUMP.—Cap., 1,500,000 galls.; comp. dup. Bituminous coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 2,400,000 galls.;

three, one covered. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by water fund. Taps, 215; made by city for $12 each. Services, w. i.; paid for by city to curb. Meters, 5; owned and repairs paid by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 29. CONSUMPTION.—(Galls.) max., 100,000; min., 50,000. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $20,000, at 7%. Sinking Fund, $2,000, not invested. Expenses: Operating, $2,500. MANAGEMENT.—Rept. by Pump. Engr., Thos. F. Kelley, June 5, '96.

9. **BLUE HILL,** Webster Co. (796.) Built in '90-1 by city; put in operation Mar. 1. SUPPLY.—Well owned by Ry. Co., pumping to stand-pipe. STAND-PIPE.—Cap., 93,000; 12 × 110 ft. DISTRIBUTION.—Hydrants, 19. Cost, $10,000. NOTE.—No rept. since '90 Manual.

10. **BLUE SPRINGS,** Gage Co. (963.) Built in '92 by city; put in operation in May. Engr., Geo. Lober, Kansas City, Mo. Contrs., Hutson & Shephard, Beatrice. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.: 2—500,000 Westinghouse. Bituminous slack used; av. cost, $2.68 per short ton. STAND-PIPE.—Cap., 28,000 galls.; iron; 8 × 85 ft., on stone foundation. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by income. Taps, 75; made by city for $8. Services, lead; paid for by consumer. Meters, 10; owned by city. Use of meters compulsory for gardeners. City can compel use of meters and any consumer may have one. Hydrants, public, 20; private, 5. CONSUMPTION.—(Galls.) av., 25,000; max., 50,000; min., 15,000. PRESSURE.—Ordinary, 175 lbs.; fire, 225 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $8,400, at 6%; due 20 yrs. from date. No sinking fund. Expenses: Operating, $900. Deficits are met by general fund. MANAGEMENT.—Mayor, W. W. Fullum; Supt., J. P. Hill. Rept. by Jas. H. Casebeer, Dec. 18, '96. SEWERS.—None.

11. **BROKEN BOW,** Custer Co. (1,647.) Built in '88-9 by Broken Bow Water-Works Co. FRANCHISE.—25 yrs. from '89. City to pay $65 to $75 per hydrant per yr. No legal difficulties. SUPPLY.—19 deep wells, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Worthington simple high pressure. New Castle and Sheridan coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 5 miles; cost extensions met by revenue. Taps, 175; made by Co. Services, ¾-in. galv. i.; paid for by property owner. Meters, 20; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 43. CONSUMPTION.—(Galls.) av., 60,000; max., 187,000; min., 25,000. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $43,000. Cap. Stock: Authorized, $50,000; paid-up, $18,000. Bonded debt, $25,000, at 7%; due in 1913. Expenses: Operating, $2,000. MANAGEMENT.—Prest., L. H. Jewett. Rept. by Secy., Frank H. Young, June 6, '96. SEWERS.—Has storm sewers only.

12. **CEDAR RAPIDS,** Boone Co. (484.) Built in '94 by city. Engr., G. H. Ellsworth, Fullerton. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Cedar River and two wells, pumping to reservoir. PUMP.—Cap., 45,000 galls.; power pump, driven by wire rope. RESERVOIR.—Cap., 76,000 galls. DISTRIBUTION.—Mains, 2 miles. Hydrants, 10. FINANCIAL.—Cost, $9,000. MANAGEMENT.—Town Board. Rept. as to pump, reservoir and distribution, by Engr., just after awarding contract, Aug., '94.

13. **CENTRAL CITY,** Merrick Co. (1,368.) Built in '88-9 by village. SUPPLY.—Four wells, 2 ins. × 40 ft., pumping to stand-pipe and direct. PUMP.—Cap., 1,000,000 galls.; Gordon & Maxwell. STAND-PIPE.—Cap., 100,000 galls.; 12 × 110 ft. DISTRIBUTION.—Mains, 3½ miles. Hydrants, 30. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $30,000. Authorized bonds, $20,000, at 6%. NOTE.—No rept. since '90-1 Manual.

14. **CHADRON,** Dawes Co. (1,867.) Built in '88-9 by town. SUPPLY.—Chadron Creek, by gravity to reservoir. PUMP.—Cap., 1,000,000 galls.; Holly hor. dup. (rept. by makers). RESERVOIR.—Cap., 1,000,000 galls.; storage and distributing, 192 ft. above and one mile from town. DISTRIBUTION.—Mains (in '90), 7 miles. Taps, 280; made by consumer. Meters, 0. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost (in '90), $45,000. Expenses: Operating, $500. MANAGEMENT.—Rept. by Water Comr., D. T. Mears. SEWERS.—None.

F 2. **COLERIDGE,** Cedar Co. (315.) Works were built here, apparently a small fire protection plant, about '93. Supply (well, lifted by windmill pump to tank?).

15. **COLUMBUS,** Platte Co. (3,134.) Built in '86-7 by town; improvements made in '94. LEGAL DIFFICULTIES.—The validity of meter ordinance is being contested in Supreme Court. SUPPLY.—35 2-in. wells, 45 to 75 ft. deep, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.: 2—1,000,000 Smith & Vaile. STAND-PIPE.—Cap., 84,600 galls.; iron; 12 × 100 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 10 miles. Taps, 200. Meters, 108. Hydrants, public, 55. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Bonded debt, $37,500. Expenses, $4,559: Operating, $2,034; int., $2,525. Revenue: Consumers, $3,352. MANAGEMENT.—Rept. by Chn. of Water Comrs., J. H. Galley, Oct. 1, '96.

16. **CRAWFORD,** Dawes Co. (571.) Built in '90 by city. Press rept., Mar. 4,

'97, stated people had just voted to sell plant to the Crawford Co., which had just developed irrigation and power system; Co. to assume $17,000 water bonds and city to pay $50 per yr. for 15 hydrants, or to take 20 or more at $40 each. Franchise to run 25 yrs., with option of purchase by city at end of 10 yrs. and of each subsequent 5 yrs. SUPPLY.—Spring, by gravity to reservoir. RESERVOIR.—Cap., 300,000 galls. DISTRIBUTION.—Mains, 3.5 miles. Taps, 20. Services, galv. i. Hydrants, public, 10. PRESSURE.—Ordinary 60 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $17,000, at 6%. MANAGEMENT.—Clerk, E. W. Dailey, Sept. 24, '96. NOTE.—Same rept. as for '90 Manual; no change.

—? **CREIGHTON,** Knox Co. (822.) Built in '94 by city for fire protection. Contrs. U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Pumped to tank. PUMP.—Worthington fire. TANK.—Cap., 36,000 galls.; 16 × 24 ft.; on natural elevation. FINANCIAL.—Cost, $10,000. Bonded debt (probably), $9,000. MANAGEMENT.—Rept. by Chf. Fire Dept., E. D. Mason, July 27, '96, and Contrs., Mar., '97.

17. **CRETE,** Saline Co. (2,310.) Bought by city (in '93?); built in '88-9 by A. L. Strang, Omaha, Mar. 8, '91. Supt. rept. works had not been accepted, on account of controversy between builder and city. Press rept. stated works changed hands in June, '92, and that Dec. 31, '92, city voted $33,000 to buy plant. FRANCHISE.—25 yrs. SUPPLY.—Wells, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Worthington non-comp. high-pressure. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 4.4 miles. Hydrants, 50. NOTE.—No official rept. since '90-1 Manual.

18. **CULBERTSON,** Hitchcock Co. (460.) Built in '88-9 by town, chiefly for fire protection. SUPPLY.—Tube well, pumping to tank with windmill pump. TANK.—Cap., 90,000 galls.; 20 × 30 ft. DISTRIBUTION.—Mains, ½ mile. Taps, 7. Hydrants, 6. FINANCIAL.—Cost, $5,965. Debt, $6,000, at 7%. NOTE.—No rept. since '90-1 Manual.

19. **DAVID CITY,** Butler Co. (2,028.) Built in '88-9 by city. SUPPLY.—Two driven wells, 290 ft. deep, one 8-in. and one 5-in., pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls. Buffalo; also 150,000 Cook deep well. Cambria (Wyo.) slack used; av. cost, $2.65 per short ton. STAND-PIPE.—Cap., 85,000 galls.; steel; 12 × 100 ft. on stone and concrete foundation, 12 ft. high. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general fund. Taps, 75; made by consumer, no fee. Services, iron; paid for by consumer. Meters: 29; owned and repaired by consumer; controlled by city. Use of meters optional with consumer; compulsory for R. Rs. and county court house. Hydrants, public, 29. CONSUMPTION.—(Galls.) av., 65,000; max., 110,000; min., 30,000. PRESSURE.—Ordinary, 40 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $25,000. Expenses: Operating, $1,975. Revenue, $995. MANAGEMENT.—Rept. by Cy. Clk., E. B. Taylor, June 18, '96. SEWERS.—None.

20. **EDGAR,** Clay Co. (1,105.) Built in '88-9 by city. SUPPLY.—Wells, pumping to stand-pipe. PUMP.—Cap., 125,000 galls.; Cook. DISTRIBUTION.—Mains, 1 mile. Services, 125. Meters, 1. Hydrants, 14. FINANCIAL.—Cost, $14,000. Bonded debt, $13,000 at 6%. Expenses, $1,500: Operating, $720; int., $780. Revenue, $700. NOTE.—No rept. since '90-1 Manual.

21. **ELMWOOD,** Cass Co. (303.) Built in '96 by town; put in operation June 10. Engr. and Contrs., U. S. Supply Co., Omaha. SUPPLY.—Wells, pumping to tank. PUMP.—Windmill. TANK.—Cap., 30,000 galls.; wood; on steel tower 50 ft. high. DISTRIBUTION.—Mains: Cost extensions met by persons benefited. Taps, 4; made by city at actual cost. Services paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 7. PRESSURE.—Ordinary, 30 to 60 lbs. FINANCIAL.—Bonded debt, $3,000 at 7%; due in 20 yrs. All expenses above revenue from consumers are met by taxation. MANAGEMENT.—Rept. by Water Comr., B. Critchfield, June 15, '96.

22. **FAIRBURY,** Jefferson Co. (2,630.) Built in '88-9 by Fairbury Water-Works Co. FRANCHISE.—25 yrs. SUPPLY.—Wells, pumping to stand-pipe, with Blue River in case of fire. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Knowles dup., one comp. and one high pressure. STAND-PIPE.—Cap., 80,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 5.7 miles. Hydrants, 63. FINANCIAL.—Cap. Stock, $75,000. Bonded debt, $50,000. NOTE.—No rept. since '90-1 Manual.

23. **FAIRMONT,** Fillmore Co. (1,029.) Built in '85-6 by city. SUPPLY.—Driven wells, pumping to tank. TANKS.—Cap., 35,000 galls.; two, one 40 and one 100 ft. high. DISTRIBUTION.—Mains, 2 miles. Hydrants, 25. FINANCIAL.—Cost, $17,500. Bonded debt, $10,000 at 7%. NOTE.—No rept. since '90-1 Manual.

24. **FALLS CITY,** Richardson Co. (2,102.) Built in '88 by city. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 300,000 galls.; Knowles, high-pressure dup. Av. cost of coal used, $2.75 per short ton. RESERVOIR.—Cap., 25,000 galls. STAND-PIPE.—Cap., 90,000 galls.; 12½ × 100 ft. DISTRIBUTION.—(In '90.) Mains, 8.8 miles. Taps, 108. Meters, 6. Hydrants, 27. PRESSURE.—Ordinary and fire, 40 lbs.; fire, 100 to 140 lbs. FINANCIAL.—(In '90.) Cost, $40,800. Bonded debt, $34,000: $24,000, at 5%; $10,000, at 6%. Expenses, $4,900: Operating, $3,100; int., $1,800. Revenue: Consumers, $3,300. MANAGEMENT.—Rept. by Mayor, J. L. Slocum, July 9, '96. SEWERS.—None.

F 3. **FIRTH,** Lancaster Co. (259.) Built in '94 by village; put in operation in Nov. Contr., E. R. Spencer. Supply, driven well, lifted by windmill pump to 30,000-gall. tank, 16 x 20 ft., on 40-ft. pine trestle. Mains, 1,350 ft. Hydrants, 5. Pressure, ordinary, 40 lbs. Rept. by E. C. Hill, Aug. 31, '96.

25. **FREMONT,** Dodge Co. (6,747.) Built in '85-6; remodeled in '91 by city. SUPPLY.—Driven wells, 6 ins. x 79 ft., pumping to stand-pipes. PUMPS.—Cap., 2,000,000 galls.; 500,000 Deane, high pressure; 1,500,000 Smedley comp. cond. dup. Rock Springs coal used; av. cost, $3.50 per short ton. STAND-PIPES.—Combined cap., 209,000 galls.; one 58,000, 10 x 100 ft.; one 150,000, 16 x 100 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 24½ miles; cost extensions met by bonds and by water-works fund. Taps, 600; made by city, including service to curb, for $9. Services, lead or iron; paid for by consumer. Hydrants, public, 104; private, 2. CONSUMPTION.—(Galls.) av., 400,000; max., 1,500,000; min., 250,000. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $79,000. Expenses: Operating, $4,700. Revenue: Consumers, unmetered, $4,835. Deficits are all met by general taxation. MANAGEMENT.—Rept. by Water Comr. and Supt., A. C. Hull, July 16, '96. SEWERS.—Has sanitary sewers.

26. **FRIEND,** Saline Co. (1,347.) Built in '94 by city; put in operation Aug. 1. Engr., A. A. Richardson, Lincoln. Contrs., Fremont Foundry & Machine Co. SUPPLY.—Two wells, 160 and 145 ft. deep, pumping to stand-pipe. PUMP.—Bradford. Bituminous pea coal used; av. cost, $2.60 per short ton. STAND-PIPE.—Cap., 93,000 galls.; 12 x 110 ft. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by bonds. Taps, 110; made by city for $2.50. Services, iron; paid for by consumer. Meters, 1; owned and repairs paid by consumer; controlled by city. Use of meters compulsory for hotel. City can compel use of meters and any consumer may have one. Hydrants, public, 48. CONSUMPTION.—(Galls.) av., 20,000; max., 40,000; min., 10,000. PRESSURE.—Ordinary and fire, 46 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $18,000, at 6%; due in 1914. Sinking Fund: $800, per annum. Expenses, $1,930: Operating, $850; int., $1,060. Deficits are met by tax levy of 15 mills. MANAGEMENT.—Rept. by Wm. Burke, Jan. 20, '97. SEWERS.—None.

27. **FULLERTON,** Nance Co. (Est., 968.) Built in '95 by city; put in operation about Mar. 1. Engr., G. H. Ellsworth, Lincoln. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—One open and 20 driven wells, pumping direct. PUMPS.—Cap., 750,000 galls.; Worthington simple high pressure. Rock Springs coal used; av. cost, $3.75 per short ton. RESERVOIR.—Cap., 90,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3 miles. Taps, 42; made by consumer, no fee. Services, w. i.; paid for by property owner. Meters, 3; owned and repairs paid by property owners; controlled by city. Use of meters optional with consumer. Hydrants, public, 21. CONSUMPTION.—(Galls.) av., 30,000; max., 50,000; min., 10,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $13,000. Debt, $12,500: Floating, $500, at 7%; Bonded, $12,000, at 6%. Expenses: Operating, $500. Revenue, $315: Consumers, unmetered, $275; metered, $40. MANAGEMENT.—Ch. Pump. Engr., E. B. Harman. Rept. by H. E. Wilson, Aug. 4, '96. SEWERS.—None.

28. **GENEVA,** Fillmore Co. (1,580.) Built in '89 by city. SUPPLY.—Two driven wells, pumping to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Gaskill. STAND-PIPE.—Cap., 93,000 galls.; 12 x 110 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 200. Hydrants, public, 35. FINANCIAL.—Cost, $29,000. Debt, $27,000. Expenses: Operating, $2,000. Revenue: Consumers, $2,500. MANAGEMENT.—Rept. by Water Comr., W. G. Haines, Oct. 10, '96.

29. **GENOA,** Nance Co. (793.) Built in '89-90 by city. SUPPLY.—Two wells, pumping to reservoir. PUMPS.—Cook steam and 10,000-gall. windmill. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 1.5 miles. Taps, 15. Hydrants, 11. PRESSURE.—Ordinary, 75. FINANCIAL.—Cost, $9,000. Bonded debt, $5,000, at 7%. Expenses, $550: Operating, $350; int., $200. Revenue, $575. NOTE.—No rept. since '90-1 Manual.

30. **GORDON,** Sheridan Co. (Precinct, 716.) Built in '93 by city. SUPPLY.—Wells, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; dup. STAND-PIPE.—Cap., 29,000 galls.; 10 x 50 ft. FINANCIAL.—Cost, $10,000. NOTE.—Information mostly from proposal advertisement and press repts.

31. **GRAND ISLAND,** Hall Co. (7,536.) Built in '86 by city. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Knowles. STAND-PIPE.—Cap., 84,000 galls.; 12 x 100 ft. DISTRIBUTION.—Mains, 10.3 miles. Taps, 542. Meters, 22. Hydrants, public, 75. FINANCIAL.—Cost, about $75,000. Bonded debt, $70,000, at 6%; due in 1907-9. Sinking Fund, $8,000. Expenses, $9,674: Operating, $5,574; int., $4,200. Revenue: Consumers, $7,000. MANAGEMENT.—Supt., Geo. Loan. Rept. by Cy. Clk., C. H. Menck, Nov. 17, '96.

32. **GRANT,** Perkins Co. (315.) Built in '89 by Lincoln Land & Town Site Co., Lincoln. FRANCHISE.—Provides for purchase of works by city after three years at cost. Rates are not subject to regulation by city. SUPPLY.—Wells, pumping to stand-pipe and direct. Water is furnished by B. & M. R. R. R. PUMP.—Cap., 50,000 galls. STAND-PIPE.—Cap., 96,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—

Mains, 3.3 miles. Taps, 72. Meters, 0. Hydrants, public, 15. CONSUMPTION.—(In '90. Galls.) av., 8,000. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Revenue (in '90), $1,400. MANAGEMENT.—Rept. by Supt., Norman Harvey, Sept. 25, '96.

33. **HARTINGTON,** Cedar Co. (Precinct, 834.) Built in '93 by city. Engr., C. F. Loweth, St. Paul. Contrs., Fairbanks, Morse & Co., St. Paul. SUPPLY.—Large open well, pumping to tank. PUMP.—Cap., 750,000 galls.; Smith-Vaile dup. TANK.—Cap., 54,000 galls., on 70-ft. wood tower. DISTRIBUTION.—Mains, 1 mile. Hydrants, 7. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—Cost (in '96), $10,000. MANAGEMENT.—Town Board. Rept., except as to cost, by Engr., in '96. SEWERS.—None.

34. **HARVARD,** Clay Co. (1,076.) Built in '95 by city; put in operation April, '95. Engr., A. A. Richardson, Lincoln. SUPPLY.—Well, 140 ft. deep, pumping to stand-pipe. PUMP.—Cap., 250,000 galls.; Laidlaw-Dunn-Gordon Co. Bituminous nut coal used; av. cost, $2.65 per short ton. STAND-PIPE.—Cap., 93,000 galls.; steel; 12 × 110 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3 miles. Taps, 50; made by city for $6.50, including service to curb line. Services, iron; paid for by consumer from curb. Meters, 1; owned by consumer; controlled by city; compulsory for one family. City can compel use of meters and any consumer may have one. Hydrants, public, 31. CONSUMPTION.—(Galls.) av., 15,000; max., 35,000; min., 5,000. FINANCIAL.—Cost, $14,000. Debt, $12,500: Floating, $5,000. Bonded, $1,000, at 7½%; due 1902; $4,500, at 7%, due 1914; $2,000, at 7%, due 1907. Sinking Fund, $800. Expenses: Operating, $700. Revenue: Consumers, $475. Deficit of $400 raised by tax. MANAGEMENT.—Rept. by Cy. Clk., C. K. Morrill, Aug. 22, '96. PROJECTED IMPROVEMENTS.—Well and pump. SEWERS.—None.

35. **HASTINGS,** Adams Co. (13,584.) Built in '86-7 by city. SUPPLY.—Eight wells, pumping to stand-pipe. Wells are 160 to 300 ft. deep, with water 125 ft. below surface. PUMPS.—Cap., 700,000 galls.; 300,000 air-lift and 7—100,000-gall. deep-well pumps. Cambria bituminous coal used; av. cost, $2.70½ per short ton. RESERVOIR.—Cap., 300,000 galls.; storage. STAND-PIPE.—Cap., 250,000 galls. FISCAL YEAR CLOSED Apr. 15. DISTRIBUTION.—Mains, 28 miles; cost extensions met by tax levy. Taps, 1,114; made by city for $2 to $4.50 each. Services, galv. i.; paid for by property owner. Meters, 151; owned by city and consumers; controlled by city; repairs paid for by owner; rental, 5 cents per 1,000 galls. extra. Use of meters optional with consumer; compulsory for some consumers. Hydrants, public, 126. CONSUMPTION.—(Galls.) av., 350,000; max., 800,000; min., 200,000. PRESSURE.—Ordinary, 50 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $158,000. Bonded debt, $110,000: $85,000, at 5%, due in 1906; $10,000, at 5%, due in 1914; $15,000, at 5%, due in 1908. Expenses: Operating, $10,290. Revenue, $18,762: Consumers, $10,902; City, fire protection, $7,560; sewer flushing, $300. Deficits are met by tax levy. MANAGEMENT.—Rept. by Comr. and Supt., L. A. Kinney, Oct. 20, '96. Ch. Pump. Engr., T. M. Clark. PROJECTED IMPROVEMENTS.—New engine and new process of raising water. Vote on issue of $8,000 in bonds for this purpose to be taken. Press rept. states bonds were voted in Dec., '96.

36. **HAY SPRINGS,** Sheridan Co. (378.) Built in '92 by village; put in operation Sept. 21. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Well, 150 ft. deep, pumping to tank. PUMP.—Cap., 7,800 galls.; Curtis double acting, run by windmill. TANK.—Cap., 51,000 galls.; white pine; 16 × 24 ft., on wood trestle 20 ft. high. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, ⅛ to ⅜ mile. Taps, 19; made by city for $2.50. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 3,150. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Bonded debt, $5,000, at 7%; due in 20 yrs. Expenses, $470: Operating, $80; int., $350. Revenue: Consumers, $140. Int. is met by taxation; income has only paid operating expenses. MANAGEMENT.—Chn., C. Weston. Rept. by Secy. and Pump. Engr., W. Henry, Jan. 8, '97.

37. **HEBRON,** Thayer Co. (1,502.) Built in '90-1 by city; put in operation May 1. SUPPLY.—Open wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Buffalo dup. STAND-PIPE.—Cap., 83,000 galls.; iron; 12 × 100 ft. DISTRIBUTION.—Mains, 2.5 miles. Hydrants, public, 34. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $25,000. MANAGEMENT.—Rept. by Cy. Clk., B. D. Ashbrook, Sept. 25, '96.

38. **HOLDREDGE,** Phelps Co. (2,601.) Bought by city in '92 (press rept.); built in '88 by Holdredge Water Co. In July, '89, Co. defaulted and system was put in hands of receiver. Feb. 28, '91, works were sold to city for $36,000, but city failing to make payment, sale was set aside on July 6. Sept. 29, system was sold to A. Paxton, Omaha, for $25,000, who sold plant back to city for $40,000 in Mar., '92, according to press rept. FRANCHISE.—20 yrs. SUPPLY.—Two 200-ft. wells, pumping to reservoir and repumping to stand-pipe and direct. PUMPS.—Cap., 2,500,000 galls.; Buffalo low pressure 1,500,000 and 1,000,000 for repumping from reservoir; water is raised from wells with two vertical 12 × 36-in. pumps. RESERVOIR.—36 × 46 ×10 ft. deep. STAND-PIPE.—Cap., 140,000 galls.; 15 × 110 ft. DISTRIBUTION.—(In '87.) Mains, 4 miles. Taps, 50. Meters, 0. Hydrants, 52. PRESSURE.—Ordinary, 80 lbs.; fire, 130 lbs. FI-

NANCIAL.—(In '87.) Cost, $62,000. Cap. Stock, $32,000. Bonded debt, $30,000. NOTE.—No rept. since '88 Manual. REFERENCES.—Stand-pipe failure, Eng. News, May 24, '94; Apr. 25, '95.

39. **HOOPER,** Dodge Co. (670.) Built in '90 by village. SUPPLY.—Driven wells, pumping to tank and direct. PUMP.—Cap., 240,000 galls.; Smedley comp. TANK.—Cap., 38,000 galls.; 18 × 20 ft. DISTRIBUTION.—Mains, 2 miles; cost extensions met by bonds. Taps, 50; made by consumer, no fee. Services, ¾-in.; paid for by consumer. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary, 48 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $6,700. MANAGEMENT.—Rept. by Water Comr., Fred. F. Heine, June 6, '96. SEWERS.—Has storm sewers only.

40. **HUMBOLDT,** Richardson Co. (1,114.) Built in '94 by city. Engr., A. A. Richardson; Contr., David Spicer. SUPPLY.—Long Branch stream, pumping to stand-pipe. PUMP.—Cap., 850,000 galls.; Deane. Av. cost of coal used, $2.15 per short ton. FILTERS.—Gravel and charcoal. STAND-PIPE.—Cap., 94,000 galls.; iron, 20 × 40 ft., on stone foundation. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 8 miles. Taps, 128; made by city for $1. Services, iron; paid for by owner. Meters: 2; owned by property owner; controlled and repaired by city. Use of meters compulsory for hotel and bank. City can compel use of meters and any consumer may have one. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $20,000. Debt, $17,500: Floating, $5,000, at 8%; Bonded, $12,500, at 6%; due 1914. Expenses, $1,350: Operating, $600; int., $750. Revenue, $1,035: Consumers, unmetered, $1,000; metered, $35. Tax of 7 mills for operating expenses, and 7 mills for int. MANAGEMENT.—Mayor, A. H. Fellen; Clk., W. J. Davis. Rept. by Supt. and Pump. Engr., All. Hales, Cy. Engr., Sept. 1, '96. SEWERS.—None.

41. **KEARNEY,** Buffalo Co. (8,074.) Built in '87 by City Water Co.; controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—25 yrs.; provides for purchase of works by city in '96 and at intervals of 5 yrs. thereafter, price to be determined by arbitration. SUPPLY.—Driven wells, pumping direct. In '90 there were 48 3-in. driven wells and one 32 × 30-ft. well. PUMPS.—Cap., 6,000,000 galls.; 2—1,500,000 Walker and 3,000,000 Hall. DISTRIBUTION.—Mains, 17 miles. Hydrants, public, 151. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy., A. E. Clancy; Treas., B. A. Maggini; Supt., Jas. Wilson. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96.

D 1. **KIMBALL,** Kimball Co. (193.) Built in '94 by city for domestic supply. Water is supplied from R. R. tank through a 2-in. pipe to all business places and several residences. Rept. by N. A. Smith, Sept. 7, '96.

42. **LEXINGTON,** Dawson Co. (1,392.) Built in '92 by city; put in operation in Apr. Engr., A. A. Richardson, Lincoln. No contr. SUPPLY.—Four 8-in. × 40-ft. wells, pumping to stand-pipe and direct. PUMPS.—Cap., 850,000 galls.; steam (Buffalo; press rept.). Wyoming slack used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 93,000 galls.; steel; 12 × 110 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4 miles. Taps, 140; made by city for $3. Meters, 0. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 45 lbs.; fire, 135 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $17,000, at 6%; due 1902. Expenses, $2,620: Operating, $1,600; int., $1,020. Revenue: Consumers, $1,000. MANAGEMENT.—Rept. by Mayor, H. O. Smith, Aug. 29, '96. SEWERS.—None.

43. **LINCOLN,** Lancaster Co. (55,154.) Built in '85 by city. SUPPLY.—Two open wells and one driven well, pumping to stand-pipes. PUMPS.—Cap., 6,000,000 galls.; 1,500,000 Dean (Deane?); 3—1,500,000 Knowles dup. Iowa nut bituminous coal used; av. cost, $2.65 per short ton. STAND-PIPES.—Combined cap., 509,000 galls.: One 142,000, steel, 16 × 75 ft.; one 367,000, steel, 25 × 100 ft. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 51 miles; cost extensions met by bonds and tax levy. Taps, 3,001; made by city at $2 for ⅝-in.; $2.75 for ½-in.; $3.25 for ⅝-in.; $4 for ¾-in. and $5 for 1-in. Services, lead; paid for by property owner. Meters: 325; owned by consumer; controlled and repaired by city. City can compel use of meter and any consumer may have one. Hydrants, public, 450; private, 3. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $450,000. Debt, $228,600: Floating, $25,000; Bonded, $203,600, at 5%. Expenses, $50,180: Operating, $40,000; int., $10,180. Revenue, $41,000: Consumers, unmetered, $33,000; metered, $8,000. MANAGEMENT.—Rept. by Supt., L. J. Byer, Aug. 13, '96. SEWERS.—Has sanitary and storm sewers.

44. **LONG PINE,** Brown Co. (562.) Built in '88 by village. SUPPLY.—Silver Springs, pumping to tank. Seven springs near Long Pine Creek. PUMP.—Cap., 250,000 galls. TANK.—Cap., 70,000 galls.; 75-ft. above main street. DISTRIBUTION.—Mains, 3 miles. Taps, 150. Hydrants, 12. FINANCIAL.—Cost, $15,000. Expenses, $600. Revenue, $625. NOTE.—No rept. since '90-1 Manual.

45. **LOUP CITY,** Sherman Co. (671.) Built in '87-8 by city. SUPPLY.—Ten driven and three open wells, pumping to reservoir. PUMPS.—Cap., 35,000 galls.; Buffalo dup.

Rock Springs nut bituminous coal used; av. cost, $0.25 per short ton. RESERVOIR.—Cap., 300,000 galls. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 2 miles. Taps, 17; made for $2.50. Services, ¾-in.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 12. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $15,000. Expenses: Operating, $350. Deficits are met by general taxation. MANAGEMENT.—Prest., T. P. Seager; Secy., M. H. Mead. Rept. by Supt. and Pump. Engr., H. Senner, Jan. 13, '97. SEWERS.—None.

46. **LYONS,** Burt Co. (532.) Built in '95 by city; put in operation in Mar. SUPPLY.—Wells, pumping to stand-pipe by water power from mill and stream in case of high water. PUMP.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon. STAND-PIPE.—Cap., 58,000 galls.; steel; 10 × 100 ft. FISCAL YEAR CLOSED Feb. 25. DISTRIBUTION.—Mains: Cost extensions met by city. Taps, 28; made by city at cost. Services, ¾-in. galv. i.; paid for by consumer. Meters, 12; owned and repairs paid by consumer; controlled by city. Use of meters compulsory for lawns. City can compel use of meters and any consumer may have one. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 1,200. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $12,000. Rept. by J. B. Lyon, Fire Chief, Sept., '96. SEWERS.—None.

47. **M'COOK,** Red Willow Co. (2,346.) Built in '83 by Lincoln Land & Town Site Co. FRANCHISE.—25 yrs. from '83, granted by county comrs. and 20 yrs. from '93, granted by city; neither provides for purchase of works by city. Rates are subject to regulation by city 8 yrs. after granting franchise and every six yrs. thereafter. Co. is not exempt from local taxes. City to pay $1,700 per yr. for public services. No legal difficulties. SUPPLY.—Five open wells near Republican River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane dup. Lignite and bituminous mixed slack (1 to 2) used; av. cost, $2.95 per short ton. STAND-PIPE.—Cap., 235,000 galls.; steel; 20 × 100 ft. FISCAL YEAR CLOSED Jan. 31, '95. DISTRIBUTION.—Mains, 10.8 miles. Taps, 326; made by consumer for $5 fee to Co. Services, lead; paid for by consumer. Meters, 9; owned, controlled and repairs paid by consumer. Use of meters optional with consumer. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 400,000; max., 550,000; min., 100,000. PRESSURE.—Ordinary, 100 lbs.; fire, 180 lbs. FINANCIAL.—Cost (in '90), $75,000. No debt. Expenses: Operating, $5,842; taxes, $644. Revenue, $17,396: Consumers, $6,504; City, fire protection, $1,500; street sprinkling, $100; public fountain, $100; other purposes, $2,706. No deficits. MANAGEMENT.—Prest., H. B. Scott; Supt., C. H. Meeker; Ch. Pump. Engr., Allen Wilson. Rept. by Secy. and Treas., R. O. Phillips, July 22, '96. SEWERS.—None.

48. **MADISON,** Madison Co. (930.) Built in '89 by city. SUPPLY.—Two 7-in. wells, 104 and 108 ft. deep, pumping to stand-pipe and direct. PUMP.—Knowles dup. Rock Springs slack used; av. cost, $3.75 per short ton, delivered. STAND-PIPE.—Cap., 38,000 galls.; wood; 18 × 20 ft., 100 ft. above city. DISTRIBUTION.—Taps, 138; made by city for $8, including service to curb. Services, galv. i.; paid for by consumer. Meters, 1; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one on approval by comr. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary, 45 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $13,500. MANAGEMENT.—Mayor, L. G. Biey. Rept. by Supt. and Pump. Engr., J. C. Horsham, June 8, '96. SEWERS.—None.

49. **MASON CITY,** Custer Co. (Est., 200.) Built in '91 by village; put in operation May 1. SUPPLY.—Driven wells, pumping to reservoir. PUMP.—Althouse windmill. RESERVOIR.—Cap., 34,000 galls. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 1,500 ft.; cost extensions met by village. Taps, 25; made by village for $5. Services, galv. i.; paid for by consumer. Village can compel use of meters and any consumer may have one. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 400. FINANCIAL.—Cost, $2,000. Bonded debt, $2,000, at 8%; due in 1911. Expenses: Operating, $100. Deficits are met by general taxation. MANAGEMENT.—Prest., F. S. Allen. Rept. by Supt., H. L. Crosley, June 6, '96. SEWERS.—None.

50. **MINDEN,** Kearney Co. (1,380.) Built in '90 by city. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMP.—Cap., 280,000 galls.; Cook. STAND-PIPE.—Cap., 93,000 galls.; 12 × 110 ft. DISTRIBUTION.—Mains, 4¼ miles. Hydrants, public, 53. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $30,000. MANAGEMENT.—Ch. Engr., G. O. Schmidt. Rept. by Mayor, G. N. Youngson, Sept. 24, '96.

51. **NEBRASKA CITY,** Otoe Co. (11,494.) Now owned by The Water & Light Co., which was incorp. in '92. Built in '87 by City Water Co. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city at end of 20 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $4,050 per yr. for public service. LEGAL DIFFICULTIES.—Trouble with city in regard to fire pressure; Co. won suit. SUPPLY.—Missouri River, pumping to settling reservoirs, thence by gravity through filters into clear water basins and pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 (?) galls.: 2—1,000,000 Worthington comp. non-cond. Makers also rept. 500,000 simple, and 1,000,000 non-comp. high pressure Worthington. Bituminous slack coal used; av. cost, $1.85 per short ton. FILTERS.—Cap., 400,000 galls.: Hyatt and American (New York). SETTLING RESERVOIR.—Cap., 12,000,000 galls.; on hill above

pumping station. STAND-PIPE.—Cap., 90,000 galls.; 12½ × 100 ft.; top 231 ft. above pumps. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by revenue. Taps, 400; made by consumer for fee of 75 cts. Services, galv. i.; paid for by consumer. Meters, 100; owned and repairs paid by consumer; controlled by Co.; yearly rental, $2. Co. can compel use of meters and any consumer may have one. Hydrants, public, 81; private, 7. CONSUMPTION.—(Galls.) av., 750,000(?); max., 100,000(?); min., 300,000(?). PRESSURE.—Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cap. Stock, paid-up, $375,000. Bonded debt, $150,000, at 6%. Expenses, $14,500: Operating and taxes, $5,500; int., $9,000. Revenue, $23,800: Consumers, $18,116; City, $4,050; R. R., $1,634. MANAGEMENT.—Prest., Thos. L. Watson; Secy., Wm. S. Downs; Treas., Louis N. Van Keuren; Mgr., D. P. Rolfe; Ch. Pump. Engr., John Huffman. Rept. by Supt., J. E. McIlreevy, Oct. 31, '96. SEWERS.—Has sanitary and storm sewers.

52. **NELIGH,** Antelope Co. (1,209.) Built in '87 by city. SUPPLY.—Elkhorn River and well, pumping to tank; filtered. PUMPS.—Cap., 260,000 galls.; Knowles. Mine run bituminous coal used; av. cost, $3.75 per short ton. TANK.—Cap., 60,000 galls.; wood, 24 × 18 ft., on trestle. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3½ miles. Taps, 130; made by city for $7. Services, iron; paid for by consumer. Meters, 12; owned, controlled and repaired by city; most meters are used on private residences. City can compel use of meters and any consumer may have one. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 15,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, $16,000. Debt, $16,000: Floating, $3,000; bonded, $13,000, at 6%; due 1906. Sinking fund, $700. A bond is paid off whenever $1,000 is in the sinking fund, at any interest payment. Expenses, Operating, $1,100. Deficits are met by general taxation. MANAGEMENT.—Mayor, Wm. Campbell; Secy., R. Wilson; Ch. Pump. Engr., E. A. Barnum. Rept. by A. E. Barnum, Aug. 11, '96. SEWERS.—None.

53. **NIOBRARA,** Knox Co. (633.) Built in '93 by city; put in operation in June. Engr., T. J. Johnson. Contr., E. J. Hanlon, both of Sioux City, Ia. SUPPLY.—Artesian well, flowing to reservoir. Direct pressure of well is used for fire protection. Well also runs a 75-bbl. flour mill. RESERVOIR.—Cap., 25,000 galls., elev. 60 ft. FISCAL YEAR CLOSED Apr. 30, '96. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by taxation. Taps, 30; made for $10. Services, iron; paid for by consumer. Hydrants, public, 5; private, 1. CONSUMPTION.—(Galls.) av., 12,000; max., 16,000; min., 8,000. PRESSURE.—Ordinary, 31 lbs.; fire, 95 lbs. FINANCIAL.—Cost, $4,000. Bonded debt, $4,000, at 6%; due in 20 yrs. No sinking fund. Expenses, Operating, $35. Revenue, Consumers, $103. Rept. by Ed. A. Fry, Dec. 19, '96. SEWERS.—None.

54. **NORFOLK,** Madison Co. (3,088.) Bought by city in '94; built in '88 by Norfolk Water-Works Co. Works were sold in '92 and again in '93 to satisfy judgments. SUPPLY.—Two wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,300,000 galls.; two Knowles, one comp., one high pressure. STAND-PIPE.—Cap., 93,000 galls.; 12 × 110 ft., 96 ft. above city. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 9 miles. Taps, 298. Meters, 5. Hydrants, public, 70. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $40,000 (purchase price). Expenses, $2,500. MANAGEMENT.—Rept. by Water Comr., H. H. Patterson.

55. **NORTH PLATTE,** Lincoln Co. (3,055.) Built in '87 by North Platte Water-Works Co.; now controlled by the American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—20 yrs.; provides for purchase of works by city in '97 and at intervals of 5 yrs. thereafter, price determined by arbitration. Maximum rates fixed in franchise. SUPPLY.—Driven wells, pumping direct. In '90 there were 22 wells, 6 ins. × 70 ft. PUMPS.—Cap., 3,000,000 galls.: 1—1,500,000 Walker; 1—1,500,000 Buffalo. DISTRIBUTION.—Mains, 7 miles. Hydrants, public, 51. PRESSURE.—Ordinary, 30 lbs.; fire, 75-100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy., J. F. Cockburn; Treas., E. B. Fogle; Supt., Wm. Coleman. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96.

56. **OAKLAND,** Burt Co. (807.) Built in '91 by city; put in operation Nov. 1. Engr., S. K. Felton. SUPPLY.—Two wells, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Barr. Iowa nut bituminous coal used; av. cost, $3.15 per short ton. STAND-PIPE.—Cap., 42,000 galls.; iron; 12 × 50 ft., on stone foundation. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3 miles; cost extensions met by water rentals. Taps, 105; made by city, no fee. Services, galv. i.; paid for by consumer. Meters, 1; owned and repairs paid by consumer; controlled by city. Use of meters optional with consumer; compulsory for manufacturers. Hydrants, public, 14. CONSUMPTION.—(Galls.) av., 45,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $14,000. Debt, $8,400: Floating, $900, at 7%. Bonded, $7,500, at 7%. Expenses: Operating, $1,600. Revenue, $929: Consumers, unmetered, $860; metered, $30; street sprinkling, $24; public buildings, $15. Deficits are met entirely by taxation. Rept. by Hans Hanson, July 31, '96. SEWERS.—None.

57. **OMAHA,** Douglas Co. (140,452.) Owned by Omaha Water Co.; built in '80-1 by City Water-Works Co.; transferred to American Water-Works Co. sometime prior to '89; reorganized in '96 under present name. See note. Has supplied South Omaha since '88. FRANCHISE.—25 yrs. from '81. City may buy works within yr. beginning

July 20, 1900. No legal difficulties. See note. SUPPLY.—Missouri River, pumping to settling basins, thence repumping to city and South Omaha, direct, and to reservoir for high service; repumping from latter for high service. PUMPS.—River plant (located at Florence, 7 miles above city): 2—15,000,000 Allis and 14,000,000 Holly-Gaskill hor. high duty. General service (including South Omaha): 18,000,000 Allis and 8,000,000 Holly vert. triple exp. High Service: 5,000,000 and 3,000,000 Holly-Gaskill hor. high duty. (The location of the 8,000,000 Holly and 5,000,000 Holly-Gaskill is not clear in repts., and may be the reverse of that given.—Ed.). Iowa slack used; av. cost, $2.50 per short ton. RESERVOIRS.—Settling: Cap., 90,000,000 galls.; seven basins at Florence; water passes alternately from one basin to the other, being decanted over weirs in thin sheets. High Service: Cap., 10,000,000 galls. FISCAL YEAR CLOSED in '95. DISTRIBUTION.—Mains, 200 miles; cost extensions met by receipts from consumers and hydrant rentals. Taps, 9,400; made by Co., free. Services, lead; paid for by consumer. Meters, 2,000; owned by consumer; controlled and repaired by Co. Use of meters compulsory for R. R. Cos., manufacturers, livery stables and all hydraulic elevators. City can compel use of meters and any consumer may have one. Hydrants, public, 1,600. CONSUMPTION.—(Galls.) max., 24,000,000; min., 12,000,000. PRESSURE.—Ordinary, 140 lbs. at pumps. Steam fire engines are seldom used. FINANCIAL.—Cost, $8,000,000. MANAGEMENT.—Receivers, E. L. Bierbower and A. B. Hunt; Ch. Engr., Geo. T. Prince; Ch. Pump. Engr., Frank Reynolds. Rept. by A. B. Hunt, June 9, '96. PROJECTED IMPROVEMENTS.—New 48-in. conduit from Florence to city; length 7 miles. SEWERS.—Has sanitary and storm sewers. NOTE.—In '92 two receivers (as above) were appointed, who were in control at time of above rept. In May, '96, bondholders bid in plant for $4,009,500 and organized Omaha Water Co., after above rept. was made; Prest., Theo. C. Woodbury, Portland, Me.; Gen. Mgr., E. L. Bierbower. Latter part of '96 city contended new Co. had no franchise, transfer from old to new Co. not having been ratified by city. (Press repts.) Dec., '96, Mayor vetoed ordinance postponing until 1907 city's right to buy works, Co. to furnish 150 additional hydrants at nominal rental of $1 each per yr. and to lay new force main from Florence. Press repts. in Mar., '97, stated city council was still negotiating for compromise with Co., but had sustained Mayor's veto. REFERENCE.—Eng. News, Jan. 14, '82.

58. **O'NEILL,** Holt Co. (1,226.) Built in '92 by city; put in operation Oct. 1. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMP.—Cap., 600,000 galls.; Knowles. Av. cost of coal used, $3.25 per short ton. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5 miles. Taps, 85; made by city engr. Services, iron; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 55 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $25,000. No sinking fund until 10 yrs. after issue of bonds. Bonds may be refunded at a lower rate of int. Expenses: Operating, $900. Tax levy of 5 mills in '95 proved insufficient to pay int.; levy of 7 mills will be made this year. MANAGEMENT.—Mayor, H. E. Murphy. Rept. by Cy. Clk., N. Martin, June 15, '96. SEWERS.—None.

59. **ORD,** Valley Co. (1,208.) Built in '87 by town. SUPPLY.—Driven wells, pumping to reservoir and direct. PUMP.—Cap., 750,000 galls.; Knowles. RESERVOIR.—Cap., 170,000 galls. DISTRIBUTION.—Mains, 3.5 miles. Taps, 63. Hydrants, 21. FINANCIAL.—Cost, $19,500. Debt, $26,000: Floating, $12,000, at 6%; due in '97. Bonded, $4,000, at 7%; due in '99. Expenses, $1,594: Operating, $874; int., $720. Revenue, $823. NOTE.—No rept. since '90-1 Manual.

F 4. **ORLEANS,** Harlan Co. (812.) Built in '88-9 by city for fire protection. Press rept. in '92 stated there was talk of extending works to give general supply. Supply, driven well, pumping to tank.

60. **PAWNEE CITY,** Pawnee Co. (1,550.) Built in '87-8 by city. City purchased of E. H. Hempstead, assignee, electric light plant and franchise about spring of '95, and having rearranged both, has consolidated water and light systems. SUPPLY.—Four wells, two of which are open, pumping to reservoir, thence repumping to stand-pipe. PUMP.—A Smith-Vaile and a Buffalo for repumping, of at least 1,000,000 galls. cap.; two 1,000,000 Cook deep-well, aggregating 240,000 galls. Pittsburg bituminous nut coal used; av. cost, $3.05 per short ton. RESERVOIR.—Cap., 100,000 galls.; one end forms side of power house foundation. STAND-PIPE.—Cap., 84,000 galls.; steel; 12 × 100 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 200. Meters, 1. Use of meters not optional with city. Hydrants, public, 38. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $28,500. MANAGEMENT.—Supt. and Water Comr., Wm. M. Headley. Rept. by Mayor, M. A. Rice, Sept. 26, '96.

61. **PENDER,** Thurston Co. (429.) Built in '93 by village; put in operation Oct., '93. Engr., L. F. Wakefield; Contrs., Robinson & Goodrich; all of Sioux City, Ia. SUPPLY.—Sixteen 2-in. driven wells, pumping to stand-pipe and direct. PUMP.—Cap., 600,000 galls.; Fairbanks-Morse dup. Hocking Valley coal used; av. cost, $7 per short ton. STAND-PIPE.—Cap., 58,760 galls.; steel; 10 × 100 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 1 mile; cost extensions met by general fund. Taps, 25; made by village for $2. Services, galv. i.; paid for by consumer. Meters, 0. Village cannot compel use of meters. Hydrants, public, 6. PRESSURE.—Ordinary, 45 lbs.; fire,

150 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $10,000, at 7%; due in 20 yrs. Sinking Fund, $300. Expenses: Operating, $225. Revenue: Public buildings, $200. MANAGEMENT.—Secy., M. N. Snyder. Rept. by Supt. and Pump. Engr., L. A. Hull, Aug. 31, '96. SEWERS.—None.

62. **PLATTSMOUTH,** Cass Co. (8,392.) Owned by Plattsmouth Water Co.; built in '86-7 by Wisconsin Construction Co., Boston, Mass. Press rept. in '92 stated bondholders had gained control of plant. FRANCHISE.—20 yrs. from '86. Rates are subject to regulation by city. Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Apr. 1, '95, city refused to pay hydrant rental on account of "lack of pressure." Co. sued city in the Federal Court at Omaha and city will confess judgment shortly. SUPPLY.—Platt and Missouri Rivers and two 8-in. wells, pumping from settling basins to stand-pipe. PUMPS.—Cap., 2,000,000 galls.: 2—1,000,000 Blake, one comp. and one high-pressure, both dup. Nut and run of mine bituminous coal used; av. cost, $2.15 per short ton. SETTLING RESERVOIRS.—Cap., 1,500,000 galls.; two basins. STAND-PIPE.—Cap., 293,000 galls.; iron; 25 × 80 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by Co., city taking one fire hydrant for each 400 ft. of main. Taps, 342; made by Co. for $2.50. Services, galv. i.; paid for by consumer. Meters, 50; owned, 45 by Co., 5 by consumers; controlled and repaired by Co.; yearly rental, $5 for ¾-in. and $6 for 1-in. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 250,000; max., 350,000; min., 200,000. PRESSURE.—Ordinary, 80 to 100 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $157,000. Cap. Stock: Authorized, $125,000; all paid-up. Bonded debt, $125,000, at 4%; due in 1906. Expenses, $9,600: Operating, $3,400; int., $5,000; taxes, $1,200. Revenue, $9,625: Consumers, unmetered, $1,975; metered, $2,400; City, fire protection, $5,250. MANAGEMENT.—Prest., Chas. E. Eddy, Boston; Treas., H. M. Plumer, Rochester, N. H.; Ch. Pump. Engr., F. H. Black. Rept. by Supt., T. H. Pollock, June 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Stand-pipe failure, Eng. News, Oct. 6, '88, and Apr. 19, '94.

63. **PONCA,** Dixon Co. (1,009.) Built in '92-3 by city for general supply. No response to inquiries.

64. **RANDOLPH,** Cedar Co. (374.) Built in '89 by village. SUPPLY.—Deep well, pumping to tank. Well has failed and $7,800 in bonds were voted for new source of supply, etc. PUMP.—Cap., about 20,000 galls. Iowa bituminous lump coal used; av. cost, $5 per short ton. TANK.—Cap., 34,000 galls.; on tower 16 ft. high. DISTRIBUTION.—Mains, 2 miles; cost extensions met by assessment of property owners. Taps, 100; made by village. Services, ¾-in.; paid for by property owner. Use of meters optional with consumer. Hydrants, public, 3. FINANCIAL.—Cost, $2,000. Bonded debt, $7,800, at 7%. Expenses: Operating, $800. Revenue: Consumers, $1,297. Deficits are met by special assessment. MANAGEMENT.—Chn. of Board, M. C. Livingston; Ch. Pump. Engr., F. P. Root. Rept. by Supt., M. E. Dolan, Sept. 29, '96. PROJECTED IMPROVEMENTS.—New pump and new source of supply.

65. **RAVENA,** Buffalo Co. (628.) Built in '92 by village; put in operation in May. SUPPLY.—Two 6-in., two 4-in. and four 2-in. wells, pumping to reservoir. PUMP.—Cap., 288,000 galls.; Buffalo. RESERVOIR.—Cap., 200,000 galls. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by general fund. Taps, 65; made by village, no fee. Services, galv. i.; paid for by property owner. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 20. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—Cost, $15,000. Debt, $3,800; Floating, $600, at 7%; Bonded, $3,200, at 7%; due in 20 yrs. Expenses, $1,091: Operating, $825; int., $266. Revenue: Consumers, $446. Deficits are met in part by occupation tax from saloons; part by general taxation. MANAGEMENT.—Supt., Jos. Simon. Rept. by Edw. Cronan, July 28, '96. SEWERS.—None.

66. **RED CLOUD,** Webster Co. (1,839.) Built in '87 by city. SUPPLY.—Two surface wells, pumping to stand-pipe and direct. PUMPS.—Cap., 250,000 galls.; Deane comp. dup. STAND-PIPE.—Cap., 70,000 galls.; 14 × 70 ft., on elevation of 60 ft. DISTRIBUTION.—Mains, 4.3 miles. Taps, 100. Meters, 3. Hydrants, 32. FINANCIAL.—Cost, $35,000. Bonded debt, $25,000, at 7%. Expenses, $3,450: Operating, $1,700; int., $1,750. Revenue: Consumers, $800. NOTE.—No rept. since '90-1 Manual.

67. **RIVERTON,** Franklin Co. (389.) Built in '88 by town. SUPPLY.—Thompson Creek, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; water power. TANK.—Cap., 27,000 galls.; 16 × 18 ft. DISTRIBUTION.—Mains, 2 miles. Taps, 73. Meters, 0. Hydrants, 8. PRESSURE.—(In '88.) Ordinary, 60 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $6,000. Bonded debt, $4,000, at 8%; due in 1908. Expenses, $370: Operating, $50; int., $320. Revenue: Consumers, $160. NOTE.—No rept. since '90-1 Manual.

F 5. **RUSHVILLE,** Sheridan Co. (484.) Built in '88 by village for fire protection. Supply, well, pumping to tank. Mains, 2,000 ft. Hydrants, 6. Cost, $3,600. Debt, $3,500, at 6%. Above as works stood in '88. In '96, D. E. F. Van Vleck, Clk., rept. that original tank had been burned and well filled up. Aug. 29, '96, A. L. Kinney rept. contract had been let for a new fire protection works, not including mains, for $2,500.

68. **SAINT PAUL,** Howard Co. (1,263.) Built in '87-8 by town. SUPPLY.—

Twenty 8 to 18-in. driven wells, pumping to stand-pipe and direct. PUMP.—Cap., 1,000,000 galls.; Buffalo dup. Rock Springs bituminous slack used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 60,000 galls.; iron; 14 × 60 ft. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxation. Taps, 120; made by city for $2.50. Services, iron; paid for by consumer. Meters, 12; owned by city or consumer; controlled by city; repairs paid by owner. Use of meters optional with consumer, except in cases of violation of rules. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 60,000; max., 100,000; min., 20,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 7%; due in 1907. Sinking Fund, none. Expenses, $2,625: Operating, $1,425; int., $1,200. Revenue, $1,025: Consumers, unmetered, $925; metered, $100. Deficit of about three-fifths of operating expenses and int. is raised by taxation. MANAGEMENT.—Ch. Pump. Engr., M. J. Decamp. Rept. by H. H. Smith, Aug. 12, '96. PROJECTED IMPROVEMENTS.—Are endeavoring to introduce meters to increase revenue. SEWERS.—None.

69. **SCHUYLER,** Colfax Co. (2,160.) Built in '90-1 by city; put in operation Feb. 1, '91. Engrs., Andrews & Burwell, Fremont. Contrs., Michigan Pipe Co., Bay City, Mich. SUPPLY.—Driven wells, pumping to stand-pipe and direct. One 6-in. × 88-ft. well; two 4-in. × 65-ft.; 26 3-in., 35 to 65 ft. deep. PUMPS.—Cap., 860,000 galls.: 2—430,000 Smith-Vaile comp. dup. Rock Spring nut bituminous coal used; av. cost, $3.25 per short ton, f. o. b. STAND-PIPE.—Cap., 85,000 galls.; iron; 12 × 100 ft., on concrete foundation. FISCAL YEAR CLOSED May 1, '95. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by city water fund. Taps, 100; made by city, free. Services, galv. l.; paid for by property owner from center of street. Meters, 5; owned, controlled and repaired by city; yearly rental, none. City can compel use of meters and any consumer may have one. Hydrants, public, 48. CONSUMPTION.—(Galls.) av., 170,000; max., 340,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Bonded debt, $25,000, at 5%; due in 20 yrs. from '91. No sinking fund as yet. Expenses, $2,450: Operating, $1,200; int., $1,250. Revenue, $2,000: Consumers, unmetered, $800; metered, $200; City, fire protection, $1,000. Annual deficits of about $500 are met by taxation. MANAGEMENT.—Supt., M. V. Church; Ch. Pump. Engr., J. E. Mulligan. Rept. by Frank H. Kolm, Dec. 28, '96. PROJECTED IMPROVEMENTS.—Additional wells. SEWERS.—None. REFERENCE.—Driven wells, Eng. News, Sept. 1, '92, illus.

70. **SEWARD,** Seward Co. (2,108.) Built in '88-9 by city. SUPPLY.—One 20 × 34-ft. well, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Holly hor. dup. Sheridan run of mine bituminous coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 93,000 galls.; iron; 12 × 110 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by consumers, with rebate of water rental. Taps, 175; made by consumer, no fee. Services, galv. l.; paid for by consumer. Meters, 70; owned by consumer; controlled and repaired by city. Use of meters compulsory where steam is used and for liveries, fountains, garden and lawn use. City can compel use of meters where water is wasted, and any consumer may have one. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 35,000. PRESSURE.—Ordinary, 52 lbs.; fire, 45 lbs. FINANCIAL.—Cost, $35,000. Bonded debt, $35,000, at 5%. Expenses: Operating, $1,600. Revenue, $1,200. Consumers, $1,000; other purposes, $200. MANAGEMENT.—Secy., Thos. Wake. Rept. by Supt. and Ch. Pump. Engr,, Jacob Goehring, Sept. 25, '96. SEWERS.—None.

57. **SOUTH OMAHA,** Douglas Co. (8,062.) See Omaha.

71. **STANTON,** Stanton Co. (857.) Built in '92 by Engr. and Contr., Fred Burrell, Fremont. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMP.—Barr comp. dup. Iowa pea bituminous coal used; av. cost, $2.75 per short ton. STAND-PIPE.—Cap., 29,000 galls.; steel; 10 × 50 ft., on elevation. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 1¼ miles. Taps, 50; made by city for $14, including service to curb. Services, galv. l.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 35,000; max., 60,000; min., 20,000. PRESSURE.—Ordinary, 70 lbs.; fire, 200 lbs. FINANCIAL.—Cost, about $9,500. Bonded debt, $7,500, at 6%; due in 1912. Expenses: Operating, $600. Revenue: Consumers, about $450. Deficits are met by general taxation. MANAGEMENT.—Ch. Pump. Engr., N. F. King. Rept. by H. F. Stephens, Aug. 1, '96. SEWERS.—None.

72. **STROMSBURGH,** Polk Co. (Est., 1,362.) Built in '88-9 by town. SUPPLY.—Driven wells, pumping direct and to stand-pipe. PUMP.—Cap., 125,000 galls.; Buffalo dup. Missouri run of mine bituminous coal used; av. cost, $3.30 per short ton. STAND-PIPE.—Cap., 22,000 galls.; iron; 8 × 60 ft., enclosed in brick tower. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by city warrants. Taps, 170; made by city for $2. Services, galv. l.; paid for by consumer. Meters, 4; owned, controlled and repaired by city. Use of meters compulsory for hotels, grist mills and brick yard. City can compel use of meters and any consumer may have one. Hydrants, public, 17. CONSUMPTION.—(Galls.) max., 50,000; min., 15,000. PRESSURE.—Ordinary, 45 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $12,000, at 7%; due in 1908. Expenses: Operating, $590. Revenue, $907: Consumers, unmetered, $847; metered, $60. Deficits are met by general taxation. MANAGEMENT.—Rept. by Ch. Pump. Engr., J. A. Carlson, July 29, '96. SEWERS.—None.

73. **SUPERIOR,** Nuckolls Co. (1,614.) Built in '88-9 by town. SUPPLY.—Well, 25 × 30 ft., pumping direct. PUMPS.—Cap., 1,500,000 galls.; 1,000,000 high service and 500,000 comp. cond. Deane. Rich Hill nut bituminous coal used; av. cost, $2.70 per short ton. FISCAL YEAR CLOSED Apr. 20. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by general city fund. Taps, 235; made by city licensed plumber for $10, including service to curb. Services paid for by consumer. Meters: 1; owned and repairs paid by consumer; controlled by city. Hydrants, public, 26. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $35,000. Expenses: Operating, $2,700. MANAGEMENT.—Rept. by Water Comr., J. T. Robbins, July 15, '96.

74. **SUTTON,** Clay Co. (1,541.) Built in '91 by city; put in operation May 23. SUPPLY.—Two driven wells, pumping to stand-pipe. PUMPS.—Cap., 60,000 galls.; Cook. Av. cost of coal used, $3 per short ton. STAND-PIPE.—Cap., 63,000 galls; steel, 12 × 75 ft. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 3 miles; cost extensions met by city general fund. Taps, 100; made by city. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 6,000. PRESSURE.—Ordinary and fire, 55 lbs. FINANCIAL.—Cost, about $19,000. Bonded debt, $16,500, at 6%; due in 5 and 20 yrs. Expenses, $2,390: Operating, $1,400; int., $990. Deficits are met by special or occupation tax. MANAGEMENT.—Rept. by Mayor, J. J. Bonekemper, July 21, 96. SEWERS.—None.

75. **SYRACUSE,** Otoe Co. (728.) Built in '94 by city; put in operation Jan. 9, '95. Engr., A. A. Richardson, Lincoln. Contrs., Miller & Egan, Nebraska City. SUPPLY.—Two 6-in. driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 500,000 galls.; Worthington simple high pressure. Wyoming bituminous coal used; av. cost, $3.20 per short ton. STAND-PIPE.—Cap., 50,000 galls.; steel, 12 × 60 ft. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 2 miles. Taps, 36; made by city for $1.25. Services, iron; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 3,800; max., 8,500; min., 900. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $11,500. Bonded debt, $10,500, at 6%; due in 1914. Expenses, $1,230: Operating, $600; int., $630. Revenue, consumers, $340. Deficits are all met by taxation. MANAGEMENT.—Prest., J. H. Arends. Rept. by Supt. and Pump. Engr., Wm. Stambro, June 13, '96. SEWERS.—None.

76. **TALMADGE,** Otoe Co. (429.) Built in '96 by city; put in operation May 1. Engr., A. A. Richardson, Lincoln. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 500,000 galls.; Worthington simple high pressure. STAND-PIPE.—Cap., 58,000 galls.; 10 × 100 ft. DISTRIBUTION.—Taps, 21. Hydrants, public, 19. PRESSURE.—Ordinary, 50 lbs.; fire, 150 lbs. MANAGEMENT.—Rept. by Chas. E. Wood. SEWERS.—None.

77. **TECUMSEH,** Johnson Co. (1,654.) Built in '88-9 by town. SUPPLY.—Well, pumping to tank; driven wells put down in '90 have been abandoned. PUMP.—Cap., 1,000,000 galls.; Cook. FISCAL YEAR CLOSED May 12. DISTRIBUTION.—Mains, 4¼ miles. Taps, 80. CONSUMPTION.—(Galls.) av., 4,500,000. FINANCIAL.—Cost, $40,000. Floating debt, $2,000. Revenue, $1,600. MANAGEMENT.—Mayor, P. H. Hopkins; Supt., L. Morrisey. Rept. by Cy. Clk., I. M. Wilson, Sept. 22, '96.

78. **TEKAMAH,** Burt Co. (1,244.) Built in '91 by village; put in operation in Nov. Des. Engr., Andrew Rosewater, Omaha. Const. Engr., H. F. Labelle, N. Y. City. Contrs., A. L. Strang & Son, Omaha. SUPPLY.—Driven wells, 100 ft deep into red sandstone, underlying bed of Missouri River, pumping to reservoir. PUMP.—Cap., 500,000 galls.; Barr dup. RESERVOIR.—Cap., 300,000 galls.; on bluff. DISTRIBUTION.—Mains, 2 miles. Services, galv. i. Hydrants, public, 25. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $16,500. MANAGEMENT.—Council; Supt., Wm. Sherman. Rept. by H. F. Labelle, Dec. 21, '94. SEWERS.—None.

79. **TRENTON,** Hitchcock Co. (267.) Built in '94 by city. SUPPLY.—Wells, pumping to tank. PUMPS.—Cap., 648,000 galls.; Fairbanks dup. TANK.—Cap., 63,000 galls. DISTRIBUTION.—Taps made for $2.50. Hydrants, public, 20. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost $8,000. Bonded debt, $5,000. MANAGEMENT.—Secy., O. W. De Wald; Ch. Pump. Engr., Clark Marsh. Rept. by Treas., T. J. Floyd, Dec. 18, '96. SEWERS.—None.

80. **UNIVERSITY PLACE,** Lancaster Co. (571.) Built in '94 by city; put in operation in Nov. Engr., A. A. Richardson, Lincoln. Contr., E. A. Rudiger, Nebraska City. SUPPLY.—Well, pumping to stand-pipe. FINANCIAL.—Cost, $20,000. MANAGEMENT.—Mayor and Council. Rept. by J. A. Alley, July '96.

81. **VALENTINE,** Cherry Co. (Est., 896.) Built in '89 by village. SUPPLY.—Minnehaduza River, pumping to tank. PUMP.—Cap., 62,000 galls. TANK.—Cap., 58,000 galls. DISTRIBUTION.—Mains, 1¼ miles. Taps, 30. Hydrants, 12. FINANCIAL.—Cost, $8,400. Bonded debt, $8,400, at 7%. Expenses, $1,200. Revenue, $1,200. NOTE.—No rept. since '90-1 Manual.

82. **VALPARAISO,** Saunders Co. (515.) Built in '87-8 by town. SUPPLY.—Well, pumping to tank. PUMP.—Cap., 50,000 galls. TANK.—Cap., 40,000 galls. DISTRIBUTION.—Mains, 1 mile. Meters, 0. Hydrants, public, 12. PRESSURE.—Ordinary, 45

lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $7,000, at 6%. Expenses, $680: Operating, $180; int., $500. Revenue, $40. MANAGEMENT.— Water Comr., John Hall. Kept. by Clk., M. B. Giffin, Sept. 24, '96.

83. **WAHOO,** Saunders Co. (2,006.) Built in '87 by Wahoo Water-Works Co.; now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—20 yrs.; provides for purchase of works by city in '99; price determined by arbitration. Rates are fixed in franchise. SUPPLY.—Driven wells, pumping direct. PUMP.—Cap., 1,500,000 galls.; 2—750,000 Walker. DISTRIBUTION.—Mains, 5 miles. Services, galv. i. Hydrants, public, 41. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 90 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy. and Treas., A. E. Claney; Supt., C. H. Adams. Kept. by Am. W.-Wks. & Guar. Co., Pittsburg, Pa., Aug. 20, '96. SEWERS.—None.

84. **WAKEFIELD,** Dixon Co. (Township, 942.) Built in '94-5 by city. Engr., —— Frost, Omaha. Contrs, Iowa Construction & Mfg. Co., Sioux City, Ia. SUPPLY.—Driven wells, pumping to stand-pipe. PUMP.—Cap., 4,000 galls.; Buffalo dup. Rock Springs slack used; av. cost, $4 per short ton. STAND-PIPE.—Cap., 65,000 galls.; iron, 12 × 30 ft., on concrete foundation. FISCAL YEAR CLOSED May 12. DISTRIBUTION.—Taps, 22; made by city for $5. Services, lead and iron; paid for by city to property line. Meters, 0. Use of meters optional with consumer. Hydrants, public, 9. CONSUMPTION.—(Galls.) av., 3,000; max., 6,500; min., 2,000. PRESSURE.—Ordinary, 37 lbs.; fire, 35 lbs. FINANCIAL.—Cost, about $10,000. Bonded debt, $7,000, at 6%. Deficits of about $900 met by taxation. MANAGEMENT.—Rept. by O. E. Martin, June, '96. SEWERS.—None.

85. **WAYNE,** Wayne Co. (1,178.) Built in '92 by city. Engr., A. A. Richardson, Lincoln. SUPPLY.—Two wells, 56 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 80,000 (?) galls.; 2—40,000 Cook deep well. Makers rept. 250,000-gall. Gordon. Bituminous slack used; av. cost, $4.35 per short ton. STAND-PIPE.—Cap., 63,000 galls.; steel, 12 × 75 ft. DISTRIBUTION.—Mains, 4 miles; cost extensions met by city. Taps, 100; made by city. Services, iron; paid for by property owner. Meters, 40; owned and repairs paid by consumer; controlled by city. Use of meters compulsory for sprinkling purposes. City can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $18,000. Bonded debt, $18,500, at 6%. Expenses, Operating, $1,500.

86. **WEEPING WATER,** Cass Co. (1,350.) Built in '88 by town. SUPPLY.—Wells, pumping to reservoir. PUMPS.—(In '88.) Cap., 550,000 galls.; Knowles. RESERVOIR.—(In '88.) Cap., 170,000 galls.; 140 ft. above main street. FISCAL YEAR CLOSED May 12. DISTRIBUTION.—Mains, 4 miles. FINANCIAL.—Cost, $15,000. Bonded debt, $13,000, at 6%. MANAGEMENT.—Rept. by Cy. Clk., Theo. Schaeffer, Sept. 24, '96.

87. **WEST POINT,** Cuming Co. (1,842.) Built in '86 by town. SUPPLY.—Driven well, pumping to reservoir and direct. In '89 there were 24 2-in. × 30-ft. wells. PUMPS.—Cap., 500,000 galls.; 2—250,000 Knowles, one steam and one water-power. RESERVOIR.—Cap., 70,000 galls.; 198 ft. above pumps. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 4 miles. Taps, 300; made by consumer, no fee. Services, galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 28. CONSUMPTION.—(Galls.) max., 250,000 in summer; min., 80,000 in winter. PRESSURE.—Ordinary and fire, 87 lbs. FINANCIAL.—Cost, $19,870. Expenses: Operating, $1,200. MANAGEMENT.—Supt., H. J. Lammers; Ch. Pump. Engr., F. L. Boyer. SEWERS.—Has sanitary and storm sewers.

88. **WILBER,** Saline Co. (1,226.) Built in '95 by town; put in operation May 8. Engr., A. A. Richardson, Lincoln. Contrs., Pomerene & Cooper, Lincoln. SUPPLY.—Wells, 50 ft. deep, pumping to stand-pipe and direct. PUMPS.—Cap., 750,000 galls.; Worthington. Av. cost of coal used, $2.50 to $3 per short ton. STAND-PIPE.—Cap., 83,000 galls.; steel, 12 × 100 ft. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 3 miles; cost extensions met by special fund. Taps, 53; made by town at $10 for ¾-in. Services, lead and galv. i.; paid for by consumer. Meters: 1; owned by town. Use of meters compulsory for flour mill. Town can compel use of meters and any consumer may have one. Hydrants, public, 39. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $18,000. Debt, $13,200: Floating, $1,200; Bonded, $12,000, at 5%, due in 20 yrs., optional after 5 yrs. Sinking Fund, none. Expenses: Operating, $800. Deficits are met by taxation. Rept. by F. J. Sarditch, June 23, '96. SEWERS.—None.

89. **WISNER,** Cuming Co. (610.) Built in '84 by town. SUPPLY.—Well, pumping to tank. Pumping done by Wisner rolling mills. TANK.—Cap., 90,000 galls. DISTRIBUTION.—Mains, 8,500 ft. Taps, 40. Hydrants, 18. FINANCIAL.—Cost, $5,000. Expenses, $480: Operating, $200; int., $280. Revenue pays operating expenses. NOTE.—No rept. since '90-1 Manual.

90. **WYMORE,** Gage Co. (2,420.) Built in '89-90 by city. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; Buffalo. STAND-PIPE.—Cap., 93,000 galls.; 12 × 110 ft. DISTRIBUTION.—Mains, 4½ miles. Taps, 63. Hydrants, 51. FI-

NANCIAL.—Cost, $38,000. Debt, $38,000: Floating, $8,000, at 7%; Bonded, $30,000, at 6%; due in 1909. Expenses, Operating, $1,200. Revenue, Consumers, $350. NOTE.—No rept. since '90-1 Manual.

91. **YORK,** York Co. (3,405.) Built in '87-8 by A. L. Strang & Co., Omaha; sold in '98 to York Water Co. Press rept. states plant was sold under foreclosure for $28,050. SUPPLY.—Driven wells and Beaver Creek, pumping to reservoir, thence repumping to stand-pipe and direct in case of fire. PUMPS.—Cap., 2,000,000 galls.: 2—1,000,000 Knowles, one comp. and one high pressure; also Cook deep-well. RESERVOIR.—Cap., 200,000 galls. STAND-PIPE.—Cap., 84,000 galls.; 12 × 100 ft., on elevation of 65 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5¼ miles. Taps, 280. Meters, 51. Hydrants, public, 60. PRESSURE.—Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—(In '88.) Cost, $75,000. Bonded debt, none. Revenue, $5,000: Consumers, $3,000; City, fire protection, $2,000. MANAGEMENT.—Prest., G. W. Post; Secy., D. E. Sedgwick; Treas., E. J. Wightman. Rept. by Supt., J. C. Peterson, Sept. 25, '96.

SOUTH DAKOTA.

1. **ABERDEEN,** Brown Co. (3,182.) Built in '85 by town. SUPPLY.—Two flowing artesian wells, by gravity. First well is 5½ in. × 906 ft. Second well is 6 ins. in diam. at top, 4½ at bottom, 1,000 ft. deep; used to run sewage pump and as auxiliary in case of accident or fire. DISTRIBUTION.—Mains, 4.5 miles. Taps, 160. Meters, 0. Hydrants, 26. PRESSURE.—(In '88.) Ordinary, 110 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $8,000, at 7%. Revenue, $2,300. NOTE.—No rept. since '90-1 Manual.

2. **ANDOVER,** Day Co. (282.) Built in '88 by village. SUPPLY.—Artesian well, by gravity. DISTRIBUTION.—Mains, ¾ mile. Taps, 15. Meters, 0. Hydrants, 4. PRESSURE.—(In '88.) Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $3,000. Debt, $2,000, at 7%. Expenses, nominal. Revenue, $180. NOTE.—No rept. since '90-1 Manual.

3. **BELLE FOURCHE,** Butte Co. (Not given.) Owned by F. A. Durst. Built in '95. FRANCHISE.—30 yrs. from '95; provides for purchase of works by city at its option after 15 yrs. City to pay $1,200 a yr. for public service. LEGAL DIFFICULTIES.—City claims that required pressure is not maintained; not yet settled. SUPPLY.—Artesian well, flowing to reservoir. RESERVOIR.—Cap., 50,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, about 75; made by owner of works at charge of $23, including service to property line and 2½ cts. per foot if further. Meters, 0. Hydrants, public, 7. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 30 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Owner, F. A. Durst. Rept. by Cy. Clk., E. M. Mitchell, June 23, '96. SEWERS.—Has storm sewers only.

4. **BROOKINGS,** Brookings Co. (1,518.) Built in '89-90 by city. SUPPLY.—Deep well, pumping to tank and direct. PUMP.—Cap., 44,000 galls.; Hughes dup. Bituminous coal used; av. cost, $4.40 per short ton, delivered. TANK.—Cap., 62,000 galls.; wood. DISTRIBUTION.—Hydrants, public, 8. PRESSURE.—Ordinary, 20 lbs.; fire, 80 to 160 lbs. FINANCIAL.—Cost, $9,700. Expenses: Operating, $1,125. MANAGEMENT.—Rept. by Supt., E. G. Davis, June 6, '96. SEWERS.—None.

5. **CANTON,** Lincoln Co. (1,101.) Built in '91 by city; put in operation July 25. SUPPLY.—Driven wells, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Smedley dup. STAND-PIPE.—Cap., 86,000 galls.; iron; 12 × 100 ft. DISTRIBUTION.—Mains, 3.5 miles. Taps, 150. Services, w. i. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $17,000, at 6%. MANAGEMENT.—Water Comr., Geo. Luther. Rept. by Mayor, J. G. Laxson, Sept. 24, '96.

—? **CENTERVILLE,** Turner Co. (723.) Built in '94 by city. Engr., A. A. Richardson, Lincoln, Neb. SUPPLY.—6-in. driven well, 100 ft. deep, pumping to stand-pipe. PUMP.—Cook deep-well, 5¾-in. cylinder, 6-ft. stroke. Makers also rept. 250,000-gall. Laidlaw-Dunn-Gordon. Av. cost of coal used, $2.25 per short ton. STAND-PIPE.—Cap., 98,000 galls.; steel; 12 × 110 ft. DISTRIBUTION.—Mains, "7 blocks."

6. **CHAMBERLAIN,** Brule Co. (939.) Built in '84 by city; improved in '91. SUPPLY.—Artesian well, 6 ins. × 800 ft., with daily flow of 700,000 galls., by gravity to and from reservoir. RESERVOIR.—Cap., 500,000 galls.; 250 ft. above main street. DISTRIBUTION.—Mains, 2.5 miles. Taps, 75. Meters, 0. Hydrants, public, 25. FINANCIAL.—Cost, $30,000. Bonded debt, $21,000, at 8%. MANAGEMENT.—Comr., Wm. Baxter. Rept. by Mayor, A. J. Burkholder, Oct. 5, '96. REFERENCE.—Eng. News, Aug. 16, '84.

F 1. **COLUMBIA,** Brown Co. (400.) Built in '86 by city for fire protection. Supply, artesian well, 6 ins. at top, 4 ins. at bottom, 1,000 ft. deep, by gravity. Mains, 1,000 ft. Hydrants, 4. Pressure, ordinary, 180 lbs. No rept. since '90-1 Manual.

7. **DEADWOOD,** Lawrence Co. (2,366.) Built in '79 by Black Hills Canal & Water

Co. FRANCHISE.—Exclusive; 20 yrs. from '79. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—White Wood Creek, by gravity to tanks. TANKS.—Cap., 250,000 galls.; wood; 218 ft. above main street. DISTRIBUTION.—Mains, 4 miles; cost extensions met by Co. Taps, 200; made by Co., free. Services, w. i.; paid for by property owner. Meters, 0. Hydrants, public, 38. CONSUMPTION.—(Galls.) av., 730,000. PRESSURE.—Ordinary and fire, 94 lbs. FINANCIAL.—Cost, $75,000. No debt. Expenses: Operating, $4,500. Revenue: Street sprinkling, $120; sewer flushing, $105. Rept. by J. M. Brelsford, June 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 20, '86.

8. **DELL RAPIDS,** Minnehaha Co. (993.) Built in '94 by city; put in operation Oct. 1. Engr., S. B. Howe; Contrs., Hubbard Stone & Construction Co.; all of Sioux Falls. SUPPLY.—Large spring in well, 26 × 24 ft. deep, pumping to tank and direct. PUMPS.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon comp. Iowa coal used; av. cost, $3.50 per short ton. TANK.—Cap., 63,000 galls.; wood; 24 × 20 ft., on granite tower 50 ft. high. DISTRIBUTION.—Mains, 2 miles; cost extensions met by taxes and bonds. City can compel use of meters and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 36,000. PRESSURE.—Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $15,600. Bonded debt, $10,000, at 6%; due in 1914. MANAGEMENT.—Mayor, O. H. Smith. Rept. by Supt. and Pump. Engr., Chas. Smith, Oct. 27, '96. PROJECTED IMPROVEMENTS.—Enlargement of well. SEWERS.—Has partial systems of sanitary and storm sewers.

F 2. **DOLAND,** Spink Co. (216.) Built in '89 by village for fire protection. Supply, artesian well, 4½ ins. × 937 ft., by gravity. Mains, 375 ft. Hydrants, 2. Cost, $4,200.

—? **EUREKA,** McPherson Co. (552.) Built in '96 by city; put in operation in Aug. Engrs. and Contrs., Fairbanks, Morse & Co., St. Paul, Minn. SUPPLY.—Open well, pumping to tank. PUMP.—Double-acting, driven by windmill. TANK.—Cap., 72,000 galls.; wood; on wooden tower 70 ft. high. DISTRIBUTION.—Mains, ½ mile. Services, w. i. Hydrants, public, 6. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—Cost, $4,500. Bonded debt, $2,000, at 6%. MANAGEMENT.—Mayor, J. E. Reagan. Rept. by Contrs., Jan. 1, '97. SEWERS.—None.

9. **FAULKTON,** Faulk Co. (462.) Built in '90 by city. Engr., J. E. Stevenson. SUPPLY.—Artesian well, by gravity. DISTRIBUTION.—Mains: Cost extensions met by tax. Taps, 50; made by city for $5. Services, iron; paid for by consumer. City cannot compel use of meters. Hydrants, public, 26. PRESSURE.—Ordinary, 25 lbs. FINANCIAL.—Bonded debt, $7,000, at 6%. MANAGEMENT.—Mayor, M. J. Jarvis; Supt., F. Young. Rept. by J. E. Stevenson, Jan. 17, '97. SEWERS.—None.

10. **FLANDREAU,** Moody Co. (569.) Built in '94 by village; put in operation Nov. 20. Const. Engr., A. E. Locke. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill., and E. H. Dow, Sioux Falls. SUPPLY.—Well and filter gallery to river, pumping to tank and direct. PUMPS.—Cap., 1,000,000 (?) galls.; Smith-Valle. (Rept. gives two Smith-Valle, a 1,000,000 and a 250,000 or 1,250,000; possibly latter is 250,000 deep-well.) Iowa bituminous coal used; av. cost, $3.80 per short ton. FILTER GALLERY.—Cap., 500,000 galls.; sand and crushed rock. TANK.—Cap., 63,000 galls.; steel.; on 82-ft. tower. DISTRIBUTION.—Mains, 3 miles; cost extensions met by city warrants. Taps, 75; made by village for $12, including service to property line. Services, galv. i.; paid for by village. Meters, 0. Village can compel use of meters and any consumer may have one. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 93,000. PRESSURE.—Ordinary, 55 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $15,000. Deficits are met by general village fund. MANAGEMENT.—Rept. by Supt., A. E. Locke, Aug. 16, '96. SEWERS.—None.

11. **HOT SPRINGS,** Fall River Co. (1,423.) Built in '92 by Water, Light & Power Co. Engr., Lou Harper, Fremont, Neb. FRANCHISE.—20 yrs. SUPPLY.—Springs of warm water, running to pump through 8-in. tiling, thence pumping to reservoir. PUMP. Cap., 600,000 galls.; Knowles, water-power. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps made by city. Meters, 1; owned and repairs paid by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50; private, 1. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $40,000. MANAGEMENT.—Prest., Fred. T. Evans; Secy., E. Kelley; Treas., H. D. Clark. Rept. by Supt., Frank Allen, Oct. 21, '96. PROJECTED IMPROVEMENTS.—Increased pump capacity. SEWERS.—None.

12. **HURON,** Beadle Co. (3,038.) Built in '84 by city. In July, '90, city sold plant to Huron Water-Works Co. for $45,000 to secure funds to carry on campaign to make Huron the state capital. Efforts to regain possession of plant were begun in '91 by citizens, and later by city government. Local court decided in favor of Co., but State Supreme Court reversed decision in Apr., '95, deciding city had no authority to sell works, and none to use proceeds as it did. Court directed city to take possession of plant, which it did, but was ousted by receiver appointed by U. S. Court to protect holders of $60,000 20-yr. bonds, Co. having expended $15,000 in improvements. Nov.,

'96, U. S. Court ordered plant turned over to city, which was done. While this court also decided in favor of city it is said that financial relations between city and Co. are yet to be adjusted by court. (Press rept.) SUPPLY.—Flowing artesian well, by gravity. DISTRIBUTION.—Mains, 3 miles; cost extensions met by water-works fund. Taps, 250; made by city for $19.20. Services, galv. i. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—Cost (in '90), $60,000. Expenses: Operating, $1,000. Revenue: Consumers, $2,000. Rept. by Comr., Alex. McIntosh. SEWERS.—Has sanitary and storm sewers.

—? **IPSWICH,** Edmunds Co. (539.) Built by town. SUPPLY.—Artesian well. DISTRIBUTION.—Hydrants, public, 2. Rept. by F. J. Tracy, June 17, '96.

13. **KIMBALL,** Brule Co. (593.) Built in or before '93 by city. SUPPLY.—Artesian well, by gravity. Press rept. in '96 stated pressure was becoming deficient and that pump or new well was talked of.

14. **MADISON,** Lake Co. (1,736.) Built in '94 by city; put in operation Aug. 15. Contrs., Fairbanks, Morse & Co. SUPPLY.—Well, pumping to stand-pipe. PUMPS.—Fairbanks-Morse comp. Iowa bituminous coal used; av. cost, $3.65 per short ton. STAND-PIPE.—Cap., 113,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 110. Services, galv. i.; paid for by consumer. Meters, 4; owned, controlled and repaired by city. Use of meters compulsory for hotels and barber shops. City can compel use of meters and any consumer may have one if he buys it. Hydrants, public, 43. PRESSURE.—Ordinary, 56 lbs. FINANCIAL.—Contract price, about $30,000. MANAGEMENT.—Prest., Geo. Waskey. Rept. by Supt., Ed. Rafferty, July 28, '96. SEWERS.—None.

15. **MELLETTE,** Spink Co. (241.) Built in '89-90 by village; put in operation in Jan. SUPPLY.—Flowing artesian well, by gravity. Pressure from well furnishes power to run a 50-bbl. flour mill and electric light plant. DISTRIBUTION.—Mains, ½ mile. Taps, 35. Hydrants, public, 4. PRESSURE.—Ordinary, 85 lbs.; fire, 165 lbs. Entire pressure of well used in case of fire. FINANCIAL.—Cost, $3,200. Bonded debt, $3,200, at 7%. MANAGEMENT.—Rept. by Town Clk., W. S. Wrigley, Sept. 24, '96.

F 3. **MILLBANK,** Grant Co. (1,207.) Built in '86 for fire protection by C. M. & St. P. Ry. Co. and city. Supply, Whetstone Creek, pumping from impounding reservoir of 120 acres area, near creek, to R. R. tank, with 12,000-gall. Knowles pump. Mains, 1,300 ft. Pressure, 31 to 81 lbs. Rept. by E. D. Ely, Mayor, June 8, '96.

16. **MILLER,** Hand Co. (536.) Built in '86 by town. SUPPLY.—Two flowing artesian wells, by gravity direct to mains. DISTRIBUTION.—Mains, ? miles. Hydrants, public, 26. FINANCIAL.—Cost, $19,000. Bonded debt, $16,000, at 6%. Expenses, $1,210: Operating, $250; int., $960. Revenue, $260. MANAGEMENT.—Clk., W. S. Little; Supt., E. M. Dunn. Rept. by Mayor, J. W. Coquillette, Sept. 29, '96.

17. **MITCHELL,** Davison Co. (2,217.) Built in '87 by town. SUPPLY.—Two artesian wells, pumping to reservoir and direct. PUMPS.—Cap., 1,000,000 galls.; Knowles. RESERVOIR.—Cap., 800,000 galls.; 110 × 13 ft.; 22 ft above pump. DISTRIBUTION.—Mains, 4.5 miles. Taps, 115. Meters, 0. Hydrants, 27. PRESSURE.—(In '88.) Ordinary, 40 to 60 lbs.; fire, 100 to 150 lbs. FINANCIAL.—Cost, $65,000. Bonded debt, $65,000. Sinking Fund: $3,000. Expenses, $6,050: Operating, $1,500; int., $4,550. Revenue: Consumers, $850. NOTE.—No rept. since '90-1 Manual.

18. **PIERRE,** Hughes Co. (3,235.) Consolidated in about '90 with gas Co. as Pierre Water, Light & Power Co.; built in '85 by Pierre Water-Works Co. Press rept. stated works were sold at receiver's sale May 29, '96, to W. R. Merriam, St. Paul, for $4,484, subject to bonded indebtedness. FRANCHISE.—Exclusive for 25 yrs. Provides for purchase of works by city after giving 6 months notice in 1900, '05 or 10.; price to be determined by appraisers. Co. was exempt from local taxes for first 10 yrs. City to pay stipulated rates for hydrants, total for a number of yrs. aggregating about $7,700. See below. LEGAL DIFFICULTIES.—City brought action against Co. in court, having in view reduction of rates for public and private services. Matter was compromised in '95 by reducing both classes of rates, $1,500 to be deducted from hydrant rental the first yr.; $1,250 the second, $1,000 the next 2 yrs., and 10% yearly thereafter, from total amount due the yearly rental at time of compromise being $7,725 (press rept.). SUPPLY.—Missouri River, pumping from settling well to reservoir; filtered through sand and gravel from river to large well. 300 ft. from bank. PUMPS.—Cap., 1,750,000 galls.: 1,000,000 comp. cond. and 750,000 Worthington fire. RESERVOIR.—Cap., 1,000,000 galls.; 150 ft. in diam., 254 ft. above town, covered with timber roof. DISTRIBUTION.—Mains, 9.5 miles. Taps, 386. Meters, 28. Hydrants, 84. FINANCIAL.—Cost, $134,820: Cap. Stock, $125,000. Debt, $104,000: Floating, $4,000, at 8%; Bonded, $100,000, at 6%, due in 1905. Revenue, $13,225: Consumers, $4,800: City, fire protection, $7,675: other purposes, $750. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Covered reservoir, Eng. News, June 21, '90.

19. **PLANKINGTON,** Aurora Co. (604.) Built in '88-9 by city. SUPPLY.—Flowing artesian well, by gravity. DISTRIBUTION.—Mains, 1 mile. Taps, 25. Hydrants, 12. PRESSURE.—Ordinary, 50 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $7,000. Debt, $10,000, at 7%. Expenses, $900: Operating, $200; int., $700. Revenue: Consumers, $200. NOTE.—No rept. since '90-1 Manual.

20. **RAPID CITY,** Pennington Co. (2,128.) Built in '85-6 by city. SUPPLY.—Spring, 214 ft. above town, by gravity to reservoir. RESERVOIR.—Cap., 400,000 galls.; 175 ft. above town. DISTRIBUTION.—Mains, 5 miles. Taps, 210. Meters, 0. Hydrants, 23. PRESSURE.—(In '89.) Ordinary, 70. FINANCIAL.—Cost, $65,000. Bonded debt, $51,000, at 7%, due in 1906. Revenue: Consumers, $4,100. NOTE.—No rept. since '90-1 Manual.

21. **REDFIELD,** Spink Co. (796.) Built in '86 by town. SUPPLY.—Flowing artesian well, by gravity. DISTRIBUTION.—Mains, 3 miles. Taps, 300. Meters, 0. Hydrants, 4. PRESSURE.—Ordinary, 160 lbs. FINANCIAL.—Cost, $5,000. Expenses, $251. NOTE.—No. rept. since '89-90 Manual.

22. **SALEM,** McCook Co. (429.) Built in '87-8 by village. SUPPLY.—Well, 225 ft. deep, pumping to tank. PUMP.—Cap., 50,000 galls.; windmill. TANK.—Cap., 60,000 galls.; 16 × 24 ft., on 25-ft. tower; built in '94 to replace one that failed. DISTRIBUTION.—Mains, 1½ miles. Taps, 9. Meters, 0. Hydrants, 3. FINANCIAL.—Cost, $3,949. No debt. Expenses, $200. Revenue, $50. NOTE.—No rept. since '90-1 Manual. REFERENCES.—Tank failure, Eng. News, July 26, Aug. 9, '94; stand-pipe, May 2, '95.

—? **SCOTLAND,** Bon Homme Co. (1,063.) Built in '89 by city for fire protection and watering stock. Rept. in '91 that mains were to be extended for domestic supply, which apparently was done. SUPPLY.—Well, pumping direct and to tank. PUMP.—Cap., 750,000 galls.; Smith & Valle. DISTRIBUTION.—Mains, 2 miles. Hydrants, 7. FINANCIAL.—Cost, $15,000. Debt, $14,000, at 6%. NOTE.—No official rept. since '90-1 Manual.

23. **SIOUX FALLS,** Minnehaha Co. (10,177.) Built in '84 by Sioux Falls Water Co.; now controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—25 yrs.; exclusive; provides for purchase of works by city, price to be determined by arbitration. Rates are fixed in franchise. SUPPLY.—Driven wells, pumping direct. PUMPS.—Cap., 5,975,000 galls.; three Worthington: 1,725,000; 1,250,000 and 3,000,000 comp. cond. (Makers rept. 1,000,000 comp. cond. and 500,000 dup. power, instead of first two.) DISTRIBUTION.—Mains, 27 miles. Hydrants, public, 112. PRESSURE.—Ordinary, 60 lbs.; fire, 90 to 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy. and Treas., J. F. Cockburn; Supt., H. G. Smith. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96. REFERENCE.—Eng. News, Aug. 22, '85.

24. **SPEARFISH,** Lawrence Co. (678.) Built in '87 by town. SUPPLY.—Springs, by gravity to tank. Springs are 4,000 ft. from tank. Av. dy. flow, 200,000 galls. TANK.—90 ft. above city. DISTRIBUTION.—Mains, 5 miles. Taps, 75. Meters, 0. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $23,550. Bonded debt, $20,000, at 6%; due in 1907. Expenses, $1,400: Operating, $200; int., $1,200. Revenue: Consumers, $1,450. NOTE.—No rept. since '90-1 Manual.

25. **STURGIS,** Meade Co. (668.) Built in '93 by Sturgis Water Co.; put in operation Mar. 9. Engr., J. D. Cook, Toledo, O. FRANCHISE.—20 yrs. from '93; if city does not extend franchise, at expiration, for another 20 yrs., on terms to be agreed on at the time, city must buy works; price to be net earnings (revenue above operating expenses) for 1 yr., capitalized at 5%. Max. rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $100 each per yr. for first 30 hydrants and $75 for each additional one; when population reaches 15,000, as shown by state or national census, all rentals shall be reduced to $60 each. Water is to be furnished free for public buildings, sewer flushing and street sprinkling, by city; also to two fountains. Contract to supply Fort Meade for 8 yrs. from Jan., '95, at $2,100 per yr. No legal difficulties. SUPPLY.—Mountain springs, 800 ft. above city, by gravity to reservoirs and to mains. RESERVOIRS.—Cap., 4,000,000 galls.: 1,000,000 and 3,000,000, 712 and 442 ft. elev. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by bonds. Taps, 102; made by Co. for $10, including service to curb. Services, galv. i.; paid for by consumer from curb. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., unknown. PRESSURE.—Ordinary 90 lbs.; fire, 134 lbs. FINANCIAL.—Cost, $85,000. Cap. Stock: Authorized, $75,000; all paid-up; paid no div'd in '95. Bonded debt, $90,000, at 7%; due in 1912. Sinking Fund, none. Expenses, $3,500: Operating, $500; int., $2,100; taxes, $900. Revenue, $6,000: Consumers, $3,000; City, fire protection, $3,000. MANAGEMENT.—Secy., S. E. Davenport; Treas., D. Jarvis. Rept. by Prest. and Genl. Mgr., J. J. Davenport, July 6, '96. SEWERS.—None.

26. **TYNDALL,** Bon Homme Co. (509.) Built in '89 by village. SUPPLY.—Artesian well, 4½ ins. × 735 ft., by gravity. DISTRIBUTION.—Mains, 6 miles. Taps, 60. Hydrants, 27. FINANCIAL.—Cost, $7,000. Expenses, nominal. Revenue, $200. NOTE.—No rept. since '90-1 Manual.

27. **VERMILION,** Clay Co. (1,496.) Built in '90 by Vermilion Water-Works Co.; put in operation Jan. 1, '91. Engr., S. V. Saleno, Chicago, Ill. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city at its option. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,200 per yr. for public service; new hydrants at $30 each per yr. LEGAL DIFFICULTIES.—Plant at first did not come up to requirements and was not accepted; afterwards was improved and

was accepted by city. Press repts. state Co. sued for hydrant rentals, but was defeated in both supreme and circuit courts; after which compromise was effected. SUPPLY.—Six driven wells, of which two are flowing, pumping to stand-pipe and direct. PUMP.—Cap., 1,000,000 galls. Bituminous coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., 70,000 galls.; storage. TANK.—Cap., 50,000 galls.; 100 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 5½ miles. Taps, 150; made by Co. for $2. Services, iron; paid for by consumer. Meters: 2; owned by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 56. PRESSURE.—Ordinary, 50 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $10,000, at 6%. Expenses, $1,350: Operating, $600; int., $600; taxes, $150. Revenue, $2,400: Consumers, $1,200; City, fire protection, $1,200. MANAGEMENT.—Prest., M. D. Thompson; Secy., C. E. Prentis; Supt., T. S. Stanley. Rept. by L. T. Sweezey, Mayor, June 11, '96. SEWERS.—Has storm sewers only.

28. **WATERTOWN**, Codington Co. (2,672.) Press rept., Sept., '96, stated city had just bought works for $107,000, paying about $15,000 in cash; built in '88 by Watertown Water-Works Co. Plant bid in by bondholders; new Co. was in process of formation at time of rept. Press rept. states that receiver was appointed in '93. FRANCHISE.—20 yrs. from '88; provides for purchase of works by city any time after 5 yrs. Max. rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $5,284 per yr. for 88 hydrants. No legal difficulties. SUPPLY.—Lake Kampeska, 4 miles from city, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup., one high pressure. Iowa nut bituminous coal used; av. cost, $4.50 per short ton. STAND-PIPE.—Cap., 211,000 galls.; 20 × 90 ft., on concrete foundation. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 9½ miles. Taps, 223; made by consumer; no fee. Services, galv. i.; paid for by property owner. Meters: 18; owned, 14 by consumers, 4 by Co.; controlled and repaired by Co.; yearly rental, $2. Use of meters compulsory for hotels, mills, etc. Co. can compel use of meters and any consumer may have one. Hydrants, public, 88. CONSUMPTION.—(Galls.) av., 130,000; max., 500,000; min., 25,000. PRESSURE.—Ordinary, 65 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $115,000. Bonded debt, $130,000. Expenses, $8,500: Operating, $4,000; int., $3,000; taxes, $1,500. Revenue, $8,909: Consumers, unmetered, $500; metered, $3,000; City, fire protection, $5,284; street sprinkling, $125. MANAGEMENT.—Ch. Pump. Engr., R. M. Gatchell. Rept. by Supt., L. D. Lyon, July 23, '96. SEWERS.—None.

29. **WHITEWOOD**, Lawrence Co. (443.) Built in '90 by Whitewood Water-Works Co.; put in operation Oct. 1. Engr., L. Harper, Fremont, Neb. Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. FRANCHISE.—20 yrs. from '90; provides for purchase of works by city in 15 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. SUPPLY.—Springs, pumping to tanks. TANKS.—Cap., 100,000 galls.; 2—50,000. DISTRIBUTION.—Mains, 1¾ miles. Taps, 60; made by Co., free. Services, galv. i.; paid for by Co. to curb. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 45,000; max., 100,000; min., about 30,000. PRESSURE.—Ordinary, 40 lbs.; fire, 55 lbs. FINANCIAL.—Cost, $12,500. MANAGEMENT.—Rept. by Prest., H. T. Cooper, June 15, '96.

30. **WOONSOCKET**, Sanborn Co. (687.) Built in '89 by city; put in operation about Oct. SUPPLY.—Artesian well, natural pressure. DISTRIBUTION.—Mains, 2 miles; cost extensions met by assessment. Taps, 200. Services, lead; paid for by consumer. Hydrants, public, 29. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 lbs.; fire, 60 to 80 lbs. FINANCIAL.—Cost, $6,000. Floating debt, $5,000, at 7%. No deficits. Rept. by Eber. Wilde, Aug. 10, '96. SEWERS.—None.

31. **YANKTON**, Yankton Co. (3,670.) Built in '84 by city. SUPPLY.—Two flowing artesian wells, one 6-in. and one 8-in., natural pressure to tanks and direct. TANKS.—Cap., 180,000 galls.; 2—90,000; wood. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 11½ miles; cost extensions met by city. Taps, 401; made by city at $1.50 for wooden mains; $6 for 10-in. and $5.50 for 6-in. iron mains. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 2,000,000; max., 3,000,000; min., 1,000,000. PRESSURE.—Ordinary, 37 lbs.; fire, 59 lbs. FINANCIAL.—Cost, $65,000. Floating debt, $21,000, at 7%. Expenses: Operating, $1,000. MANAGEMENT.—Chn., Wm. Stockwell. Rept. by Supt., Anton Veling, June 6, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Sept. 13, '84.

NORTH DAKOTA.

1. **BISMARCK**, Burleigh Co. (2,186.) Built in '87 by Bismarck Water Co. Receiver was appointed in '94. SUPPLY.—Missouri River, pumping to reservoirs. PUMPS.—(In '89.) Cap., 3,000,000 galls.; Deane. RESERVOIRS.—(In '89.) Cap., 2,000,000 galls.; 2—1,000,000. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 7 miles. Taps, 260. Meters, 18. Hydrants, public, 45. FINANCIAL.—Cost (in '88), $110,000. Cap., Stock, $100,000. Bonded debt, $100,000, at 6%. MANAGEMENT.—Rept. by Receiver, C. B. Little, Oct. 19, '96.

2. **ELLENDALE,** Dickey Co. (761.) Built in '86 by town. SUPPLY.—6-in. artesian well, by gravity. DISTRIBUTION.—Mains, ¾ mile. Taps, 94. Hydrants, public, 10. FINANCIAL.—Cost, $7,075. Bonded debt, $7,950. Expenses: Operating, nominal; int., $556. Revenue: Consumers, $675. MANAGEMENT.—Rept. by City Auditor, Geo. Merchant, Sept. 24, '96.

3. **FARGO,** Cass Co. (5,664.) Bought by city Oct. 1, '90, at a valuation of $65,748. Built in '89 by Fargo Water & Steam Co., under 30-yr. franchise. SUPPLY.—Red River of the North, pumping direct. PUMPS.—Cap., 2,250,000 galls.; 1,500,000 and 750,000 Holly quadruplex. Wood used; av. cost, $3.25 per cord. FISCAL YEAR CLOSED Aug. 31. DISTRIBUTION.—Mains, 18 miles; cost extensions met by sale of bonds. Taps, 500; made by city. Services, lead; paid for by property owner. Meters, of which 160 were in use in '90, were taken out when works were purchased by city, as they did not work satisfactorily with water. City can compel use of meters, and any consumer may have one. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 2,000,000. Water is supplied to three R. Rs. PRESSURE.—Ordinary, 40 lbs.; fire ,100 lbs. FINANCIAL.—Cost, (in '90), $78,000. Bonded debt, $55,000: $40,000 at 6%, due in 1911; $15,000 at 6%, due in 1915. Sinking Fund: $7,000, not invested. Expenses: Operating, $12,048. Revenue: Consumers, $13,500. No deficits. MANAGEMENT.—Supt., C. B. Thimmens. Rept. by City Auditor, A. O. Rupert, Sept. 25, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Jan. 20, '83.

4. **GRAFTON,** Walsh Co. (1,594.) Built in '86 by city. SUPPLY.—Artesian well, by gravity, with pumping for fire protection. Well is 450 ft. deep; water rises 30 ft. above surface; daily flow, 472,500 galls. PUMP.—Cap., 1,500,000 galls.; Gordon dup. Wood used; av. cost, $3 per cord. DISTRIBUTION.—Mains, 3 miles; cost extensions met by taxation. Water is used but slightly for domestic purposes as it contains about 3% (?) of salt and some sulphate of magnesia. Hydrants, public, 12. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost (in '90), $29,460. Expenses: Operating, $1,800. MANAGEMENT.—Rept. by Mayor, J. Tombs, June 6, '96.

5. **GRAND FORKS,** Grand Forks Co. (4,979.) Built in '82 by city. SUPPLY.—Red Lake River, pumping direct. Settling basin, filter and clear water reservoir was added in '94-5, necessitating additional pumping. PUMPS.—(In '89.) Cap., 5,000,000 galls.; 500,000 Knowles, 1,500,000 Blake dup., 3,000,000 "special design." FILTER BED.—Area, 18,300 sq. ft.; covered. RESERVOIRS.—Cap., 1,147,000 galls.; 147,000 settling and 1,000,000 clear water; both covered. DISTRIBUTION.—Mains, 6.2 miles. Taps, 300. Meters, 21. Hydrants, 46. PRESSURE.—(In '88.) Ordinary, 80 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $78,000. Bonded debt, $48,000, at 7%. Sinking Fund, $11,500 at 7%. Expenses, $7,141. Revenue: Consumers, $7,556. NOTE.—No rept. since '90-1 Manual. REFERENCES.—Covered filter bed, settling and clear water reservoir, Eng. News, May 23, '95, illus.

6. **JAMESTOWN,** Stutsman Co. (2,296.) Built in '87-8 by town. SUPPLY.—Flowing artesian well, 1,500 ft. deep, by gravity. DISTRIBUTION.—Mains, 1 mile. Taps, 16. Meters, 0. Hydrants, 20. PRESSURE.—Ordinary, 95 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $10,000, at 7%. Expenses, nominal. NOTE.—No rept. since '90-1 Manual.

7. **LISBON,** Ransom Co. (935.) Built in '96 by city; put in operation Oct. 1. Engr., C. F. Loweth, St. Paul. Contrs., Kennedy & Porritt, Fargo. SUPPLY.—Large open well, pumping to elevated tank. PUMP.—Cap., 24,500 galls.; Deming triplex vert. driven by 10-HP. Otto gasoline engine. TANK.—Cap., 72,000 galls.; wood, on 75-ft. steel tower. DISTRIBUTION.—Mains, 2½ miles. Taps, 30; made by city. Services, iron. Meters: controlled by city and repaired by consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 20. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost, $16,000. MANAGEMENT.—Rept. by Supt., Frank Russell, Oct. 21, '96, and by Engr. SEWERS.—None.

F 1. **MANDAN,** Morton Co. (1,328.) Built in '84 by town for fire protection, relaid mains in '94 at cost of $5,000. Supply, Heart River, pumping direct, with 500,000 Worthington pumps, by N. P. Ry. Co., in case of fire only. Hydrants, public, 13. Pressure. 100 lbs. Rept. by J. L. Bowers, City Auditor, July 11, '96. REFERENCE.—Eng. News, May 9, '85.

8. **MINOT,** Ward Co. (575.) Built in '94 by city. Contr., Jas. H. Scofield, Minot. Press rept. states $10,000 of bonds were voted.

9. **VALLEY CITY,** Barnes Co. (1,089.) Built in '95 by city; put in operation July 1. Engrs. and Contrs., U. S. Wind Engine & Pump Co., Batavia, Ill. SUPPLY.—Cheyenne River, pumping to tank. PUMP.—Cap., 500,000 galls., Worthington simple high pressure. Lignite used; av. cost $3 to $3.50 per short ton. FILTERS.—Cap., 1,150,000 galls.; sand and gravel; depth of bed, 15 ft. TANK.—Cap., 63,000 galls.; on hill, 150 ft. high. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 2¼ miles. Taps, 50; made by city. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 31,500. PRESSURE.—Ordinary, 65 lbs.; fire, 150 lbs. Steam fire engines are used. FINANCIAL.—Cost, $12,000. Bonded debt, $10,000: $5,000 at 6%, due in 1910; $5,000 at 6%, due in 1915. Expenses: Operating, $900. MANAGEMENT.—Supt., Robt. Burt. Rept. by J. J. Dobbin, June 10, '96. SEWERS.—Has sanitary sewers.

10. **WAHPETON,** Richland Co. (1,510.) Built in '85 by Wahpeton Water Co.; later passed to control of New Hampshire Trust Co., Manchester, trustees for bondholders. In '90, city leased works, and by making semi-annual payments will own them at end of 20 yrs. No legal difficulties. SUPPLY.—Otter Tail River, by gravity, to settling well, thence pumping direct. PUMP.—Cap., 1,500,000 (makers rept. 500,000) galls.; Worthington comp. non-cond. Wood used. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by city. Taps, 282; made by city for $3. Meter: 1; owned by consumer; controlled and repaired by city. Use of meters optional with consumer; compulsory for printing office. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 38,424. PRESSURE.—Ordinary, 90 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $92,000. Expenses: Operating, $5,000. Revenue, $6,861: Consumers, unmetered, $6,796; metered, $65. MANAGEMENT.—Prest., Jas. Purdon; Secy., A. E. Aspinwall; Ch. Pump. Engr., Thos. McCabe. Rept. by Supt., Anton Gilles, Sept. 23, '96. SEWERS.—Has sanitary sewers.

WYOMING.

1. **BUFFALO,** Johnson Co. (1,087.) Built in '95 by city; put in operation May 7. Engr., Elwood Mead; Contr., Chas. E. McGarvey; both of Cheyenne. SUPPLY.—Clear Creek, by gravity. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 3 miles, to city limits. Taps, 95; made by city at actual cost. Services, kal. i.; paid for by consumer. Meters, 0. Hydrants, public, 10. CONSUMPTION.—Unknown. Use of water unlimited, no charge made for irrigating purposes. PRESSURE.—Ordinary, 85 lbs.; fire, 175 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $45,000: $40,000 at 6%, due in 1914; $5,000, at 7%; due now. Expenses, $3,025: Operating, $275; int., $2,750. Revenue: Consumers, $2,340. Deficits are met by generaly taxation. MANAGEMENT.—Rept. by Cy. Clk., Gustave E. A. Moeller, June 23, '96. SEWERS.—None.

2. **CARBON,** Carbon Co. (1,140.) Built by Union Pacific Ry. No Engr. nor Contr. SUPPLY.—Spring, direct from receiving well to distributing reservoir. PUMP.—Cap., 100,000 galls.; Barr dup. Bituminous slack coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 20,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 20; made by Co. for $3. Services, galv. i.; paid for by property owner. Meters: 2; owned by Co. Use of meters compulsory for boiler users. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—Ordinary and fire, 80 lbs. MANAGEMENT.—Rept. by Supt., E. L. Emery, Rock Springs, Jan. 28, '97. SEWERS.—None.

3. **CASPER,** Natrona Co. (544.) Built in '96 by city; tested in Aug. Contr., C. E. McGarvey, Cheyenne. SUPPLY.—Springs, by gravity, fall being 800 ft. Various repts. indicate that dam was built across canyon, 5½ miles above city. FINANCIAL.—Cost, $32,000. Bonded debt, $30,000. MANAGEMENT.—Address Jno. McGrath. Rept. mostly by M. L. Bishop, July, '96.

4. **CHEYENNE,** Laramie Co. (11,690.) Built in '82 by town. SUPPLY.—Surface and underground flow of Crow Creek, by gravity from upper filter beds into distributing reservoir and pumping from lower filter beds for irrigation and fire purposes; also open ditch into three storage reservoirs. PUMPS.—Cap., 4,500,000 galls.: 3,000,000 Gaskill hor. dup.; 1,500,000 Knowles hor. single. Bituminous pea coal used; av. cost, $2.15 per short ton; "Hanna" nut, $2.80. FILTERS.—Sand and gravel in bed of creek. RESERVOIRS.—Cap., 193,100,000 galls.; Storage: 94,000,000, 25,000,000 and 72,000,000. Distributing: 2,000,000 and 1,100,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 25.6 miles; cost extensions met by revenue. Taps, 1,150; made by licensed plumbers for consumer at $12 each. Services, lead; paid for by consumer, Meters, 1; owned and repairs paid by consumer; controlled by city. Use of meters optional with consumer. Hydrants, public, 98; private, 11. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,250,000; min., 750,000. PRESSURE.—Ordinary, 50 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $240,800. Bonded debt, $162,500: $65,000, at 6%; due in 1921; $28,500, at 6%; due in 1922; $69,000, at 6%; due in 1922. Sinking Fund, none. Expenses, $17,500: Operating, $7,750; int., $9,750. Revenue: Consumers, $17,456. MANAGEMENT.—Mayor, Saml. Merrill; Ch. Pump. Engr., A. S. Artist. Rept. by Cy. Engr. and Supt., H. B. Patten, Aug. 31, '96. SEWERS.—Has sanitary sewers only. REFERENCE. — Eng. News, Mar. 6, '86.

5. **DANA AND HANNA,** Carbon Co. (Dana, 253; Hanna, 260.) Built in '90 by Rattle Snake Creek Water Co.; controlled by U. P. Ry. Co.; put in operation Oct. 10. Mar., '97, Supt. rept.: "Dana is an abandoned coal camp with no population. Hanna is a coal camp containing about 150 families, who draw from public taps and pay $2 per house" (per month or yr.?). SUPPLY.—Rattlesnake Creek, by gravity. RESERVOIRS.—Cap., 2,000,000 galls.; 2—1,000,000 distributing, 200 ft. above town. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 25 miles; cost extensions met by Co. Taps, 150; made by Co. for $2. Services, ¾-in. w. i.; paid for by property owner. Meters: 2; owned by Co. Use of meters not optional with consumer; compulsory for Co.'s mines. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 100,000. PRES-

SURE.—Ordinary, 85 lbs. MANAGEMENT.—Rept. by Supt., E. L. Emery, Rock Springs, Aug. 10, '96. SEWERS.—None.

6. **DOUGLAS**, Converse Co. (491.) Built in '89-90 by town. SUPPLY.—Platte River, pumping to reservoir. PUMPS.—Knowles dup. DISTRIBUTION.—Mains, 2 miles. Taps, 168. Hydrants, 10. FINANCIAL.—Cost, $12,299. Bonded debt, $7,000, at 7%. Sinking Fund: $350. Expenses, $1,928: Operating, $1,429; int., $490. Revenue: Consumers, for 6 months, $651. NOTE.—No rept. since '90-1 Manual.

7. **EVANSTON**, Uinta Co. (1,995.) Built in '89-90 by town; put in operation Apr. 1. SUPPLY.—Bear River, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Deane. RESERVOIR.—75 × 100 × 15 ft. DISTRIBUTION.—Mains, 8 miles. Services, kal. 1. Hydrants, public, 54. PRESSURE.—Ordinary, 85 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $38,000. Bonded debt, $20,000, at 6%. Expenses: Operating, $2,000. Revenue, $3,500. MANAGEMENT.—Rept. by Town Clk., Jas. B. Smith, Sept. 25, '96. PROJECTED IMPROVEMENTS.—It is expected to have in operation in fall of '96, a gravity system to connect with present one, thus giving two sources of supply; est. cost, $6,000, for which bonds will be issued. New reservoir, 210 × 55 × 13 ft., supplied by ditch from river, 8 miles long.

11. **GREEN RIVER**, Sweetwater Co. (723.) See Rock Springs.

5. **HANNA**, Carbon Co. (260.) See Dana.

8. **LARAMIE**, Albany Co. (6,388.) Built in '70 by U. P. Ry. Co. Town paid Ry. $18,000 toward construction of works and has use of water free for fire protection and private consumption to all who will pipe it from mains at their own expense. Various repts. in the yrs. '92-5 stated city was to issue from $40,000 to $100,000 bonds for new supply, but no definite information could be obtained. SUPPLY.—Springs, by gravity from reservoir. DISTRIBUTION.—(In '88.) Mains, 5 miles. Hydrants, 24. NOTE.—No official rept. since '90-1 Manual.

9. **NEW CASTLE**, Weston Co. (1,715.) Built in '90 by New Castle & Cambria Water Supply Co. FRANCHISE.—Provides for purchase of works by city in 20 yrs., or time may then be extended. Rates subject to regulation by city ordinance. SUPPLY.—Sweet Water Creek, 12 miles distant, by gravity, through flume. DISTRIBUTION.—Mains, 3 miles. Taps, 50. Meters, 3. Hydrants, 11. FINANCIAL.—Cost, $50,000. Revenue, City, $15,000. NOTE.—No rept. since '90-1 Manual.

10. **RAWLINS**, Carbon Co. (2,235.) Now owned by city. U. P. Ry. Co. supplied town from '82 till '84, supply being derived from artesian wells. In '84 well was drilled by Carbon Co., 500 ft. deep, water being within 40 ft. of surface. This well supplied town till '90, when break in casing about 200 ft. below surface ruined well. In '90 Ry. Co. drilled second well, which now supplies town. Apr. 14, '91, voters authorized issuance of $35,000 of bonds to sink new well, pipe town and erect 54 hydrants. Press rept., June, '92, stated new works were about completed. Clk. (see below) rept. in '96 that city now owns works. SUPPLY.—Three artesian wells. PUMP.—Cap., 750,000 galls.; Deane dup. (rept. by makers). RESERVOIRS.—Two. FINANCIAL.—Bonded debt, $35,000. MANAGEMENT.—Mayor, Edwin T. Burke. Rept. by Clk., H. B. Jennings, Oct. 9, '96.

11. **ROCK SPRINGS AND GREEN RIVER**, Sweetwater Co. (Rock Springs, 3,406; Green River, 723.) Known as Green River Water-Works Co. Built in '86-8 and still owned by U. P. Ry. Co. FRANCHISE.—Rates are not subject to regulation by city. Co. not exempt from local taxes. City to pay $40 per hydrant per yr. No legal difficulties. SUPPLY.—Green River, 16 miles distant, pumping to storage reservoir. PUMP.—Cap., 800,000 galls.; Knowles special. Bituminous slack coal used; av. cost, $1 per short ton. RESERVOIR.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 40 miles. Taps, 350; made by Co. for $3. Services, w. i.; paid for by consumer. Meters: 195; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 65 lbs.; fire, 80 lbs. FINANCIAL.—No debt. MANAGEMENT.—Ch. Pump. Engr., Wm. Slater, Green River. Rept. by Supt., E. L. Emery, Rock Springs, June 7, '96. SEWERS.—None.

12. **SHERIDAN**, Sheridan Co. (281.) Built in '95 by City. Contr., E. A. Rudiger, Nebraska City, Neb. SUPPLY.—Big Goose Creek, by gravity. FINANCIAL.—Cost, $75,000. Bonded debt (press rept.), $75,000. MANAGEMENT.—Rept. by citizen, Oct., '96.

13. **SUNDANCE**, Crook Co. (515.) Now owned by city; built in '88 by Sundance Water Supply Co., under 20-yr. franchise. City bought plant May 1, '96. SUPPLY.—Springs, by gravity. RESERVOIRS.—Cap., 120,000 galls.; two storage and distributing, 80,000 and 40,000. TANKS.—Cap., 125,000 galls.; wood; one, 80 × 14 × 10 ft., 83,000 galls., and one, 40 × 14 × 10 ft., 42,000 galls. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2½ miles. Taps, 52; made by city. Services, iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 10. PRESSURE.—Ordinary, 40 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $9,750, at 6%; due in 1926. Expenses, $1,470: Operating, $800; int., $580; taxes, $90. Revenue, $1,300: Consumers, $1,100; other purposes, $200. Deficits of about $200 met by general taxation. MANAGEMENT.—Prest., J. W. Rogers; Treas., F. E. Rounds. Rept. by Supt., C. H. Blackwell, June 14, '96. SEWERS.—None.

MONTANA.

1. **ANACONDA,** Deer Lodge Co. (8,975.) Built in '88 by Anaconda Water-Works Co. FRANCHISE.—Perpetual. City to pay $100 per hydrant per yr. SUPPLY.—Mountain springs, by gravity to reservoir. RESERVOIR.—Cap., 8,500,000 galls. DISTRIBUTION.—Mains, 15.8 miles. Taps, 950. Services, ¾-in. Meters, 0. Hydrants, public, 35. CONSUMPTION.—Unknown. FINANCIAL.—Cost, $107,000. MANAGEMENT.—Anaconda Copper Mining Co., W.-W. Dept. Rept. by Mgr., Albert M. Scott, Sept. 25, '96.

2. **BELT,** Cascade Co. (Precinct, 375.) Built in '96 by Anaconda Copper Mining Co.; put in operation Aug. 1. SUPPLY.—Wells, pumping to tank. TANK.—Cap., 60,000 galls. DISTRIBUTION.—Hydrants, public, 0; private, 10. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 70 lbs. Rept. by Anaconda Copper Mining Co., Coal Dept., Aug. 25, '96. SEWERS.—None.

3. **BILLINGS,** Yellowstone Co. (836.) Built in '86-7 by Billings Water-Power Co. FRANCHISE.—20 yrs. from '87; with option of purchase of works by city at end of 20 yrs., price to be determined by three comrs., chosen by city and Co. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $100 each for first 25 hydrants, $75 each for next 15 and $50 each for all over 40. No legal difficulties. SUPPLY.—Yellowstone River, pumping direct. Canal one mile long, 18 ft. wide at bottom, with 7 ft. of water and 12-ft. head, supplies pumps and water power. PUMPS.—Cap., 3,500,000 galls.; 2,000,000 Blake and Dean (?) water power and 1,500,000 Buffalo steam. Bituminous coal used; av. cost, $3 per short ton. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by receipts. Taps, 346; made by Co. for $5. Services, galv. i.; paid for by consumer. Meters: 1; owned by R. R. Co. Use of meters optional with Co., except for private houses. Hydrants, public, 85. CONSUMPTION.—(Galls.) av., 250,000; max., 500,000; min., 150,000. PRESSURE.—Ordinary, 50 lbs.; fire, 110 lbs. FINANCIAL.—Cannot be given, as waterworks and electric plant were built and are operated together. MANAGEMENT.—Prest., Henry Belknap; Ch. Pump. Engr., W. H. Smith. Rept. by Secy., Treas. and Supt., H. W. Rawley. SEWERS.—None.

4. **BOZEMAN,** Gallatin Co. (2,143.) Built in '89 by Bozeman Water-Works Co. See note. SUPPLY.—Lyman Creek, spring-fed mountain stream, by gravity. RESERVOIR.—(In '89.) Cap., 1,250,000 galls. DISTRIBUTION.—Mains, 9 miles. Taps, 357. Meters, 8. Hydrants, public, 68. FINANCIAL.—Cost (in '90), $110,000. Bonded debt, $104,000, at 6%. MANAGEMENT.—Prest., H. E. Stevens; Secy., Tracy Lyon; Treas., R. B. C. Bement, all of St. Paul, Minn. Rept. by Res. Supt., A. E. Davidson, Sept. 25, '96. NOTE.—Feb. 2, '97, Geo. D. Pease, Cy. Clk., rept. city was thinking of buying works, but had not yet decided to order an election on same.

5. **BUTTE CITY,** Silver Bow Co. (10,723.) First works built in '82-3 by Silver Bow Water Co. Present works built in '91-5 by Butte City Water Co. Des. Engr., Chester B. Davis, Chicago. Const. Engr., Eugene Carroll. For various Cos. and projects, see '90-1 Manual. Since '91, city has several times advertised for bids for public supply. FRANCHISE.—Perpetual; does not provide for purchase of works by city. Rates are limited by franchise. Co. is not exempt from local taxes. City to pay for fire protection, according to contract of three years made July 1, '96. SUPPLY.—Mountain streams, flowing into impounding reservoir, thence by gravity and by pumping to distributing tanks. PUMPS.—Cap., 10,500,000 galls.: 2—3,000,000 6-cylinder triple exp., and 1,500,000 hor. triple high duty Worthington; 1,000,000 Knowles comp. dup. and 2,000,000 Gordon power, with Allis engine. Montana coal used; av. cost, $4 per short ton. RESERVOIR.—Cap., 200,000,000 galls.; impounding, formed by masonry dam, 88 ft. high, 13 miles from city. TANKS.—Two, for pumping system; cap., 120,000 galls. (70,000 and 50,000). DISTRIBUTION.—Mains, 60 miles. Taps, 3,000; made by Co. for $6.50. Services, lead and iron; paid for by consumer. Meters: 235; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 310; private, 44. CONSUMPTION.—(Galls.) av., 4,000,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $2,000,000. Cap. Stock, paid-up, $2,000,000. Bonded debt, $2,000,000, at 6%. Revenue: City, fire protection, $20,000; street sprinkling, $2,500. MANAGEMENT.—Prest., T. E. Hopkins; Secy. and Treas., Thos. Nelson; both of Boston, Mass. Rept. by Supt., Eugene Carroll, July 1, '96. PROJECTED IMPROVEMENTS.—Building flumes and placing new pump. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Concrete masonry dam and intake, Eng. News, Dec. 15, 22, '92, illus.; redwood pipe, Jan. 5, '93, illus.; wooden pipe, Feb. 16, '93, illus.; Basin Creek dam, Aug. 17, '93, Sept. 5, '95.

D 1. **CASCADE,** Cascade Co. (Precinct, 134.) Built in '89 by Perkins & Taylor (now Taylor & Johnson) for domestic use. Supply, flowing well, one mile from village, by gravity to 50,000-gall. storage reservoir. Taps, 21. Cost, $4,500. Expenses: Operating, $75; taxes, $24. Rept. by J. B. Taylor, July 17, '96.

6. **DEER LODGE CITY,** Deer Lodge Co. (1,463.) Built in '87 by Deer Lodge Water Co. SUPPLY.—Mountain stream, by gravity. RESERVOIRS.—Two: One 20 × 100 × 12 ft. deep; one 25 × 25 × 12 ft. DISTRIBUTION.—Mains, 12 miles. Taps, 200. Meters, 0. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 70,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $54,000. Cap. Stock: Authorized, $60,000; all

paid-up. No debt nor bonds. Expenses, $1,000. Revenue, $6,000: Consumers, $5,000; City, fire protection, $1,000. MANAGEMENT.—Prest., N. J. Bielenberg; Secy., Willard Bennett; Treas., Wm. Coleman. Rept. by Collector, L. Coleman, Sept. 25, '96.

P 1. **DILLON,** Beaverhead Co. (1,012.) Jan. 20, '97, Frank Eliel rept. water-works would soon be agitated.

7. **FORT BENTON,** Choteau Co. (624.) Bought by town in '93. Built in '87-8 by Ft. Benton Water Co., and afterwards owned by National Tube Works Co., McKeesport. Press rept. states W. G. Conrad sold works to city. SUPPLY.—Missouri River, pumping direct. Press rept. in '95 or '96, stated town would improve supply by putting in filter or well. PUMPS.—Cap., 2,000,000 galls.; Blake. DISTRIBUTION.—Mains, 5.5 miles. Taps, 225. Meters, 0. Hydrants, 25. PRESSURE.—Ordinary, 40 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $52,000. Expenses: Operating, $4,800. Revenue; City, $2,500. NOTE.—No official rept. since '89-90 Manual.

8. **GARDINER,** Park Co. (Precinct, 117.) Built in '95 by Jno. Spiker. SUPPLY.—Yellowstone River, pumping to tank. Press rept., June, '96, stated works (pumping station) had just been destroyed by freshet. FINANCIAL.—Cost, $3,000.

9. **GREAT FALLS,** Cascade Co. (3,979.) Built in '89 by Great Falls Water Co. FRANCHISE.—Exclusive; 20 yrs. from Mar., '89. Rates are fixed by franchise. Co. is not exempt from local taxes. City to pay $90 each for first 75 hydrants and $60 each for additional. LEGAL DIFFICULTIES.—City attempted in '95 to use water fund for other purposes and passed an ordinance to that effect; Co. enjoined the city from thus transferring money and the ordinance was repealed after legal advice. Press rept., Dec., '96, stated Co. had just won suit for hydrant rental for half-year ending Oct. 31, '96, city alleging it could not legally raise the sum due Co., and attacking validity of franchise. SUPPLY.—Missouri River, pumping direct. PUMPS.—Cap., 8,500,000 galls.: 2—1,250,000 and 1,000,000 Gordon; 5,000,000 Holly-Gaskill hor. high duty. Bituminous slack used; av. cost, $1.50 per short ton. DISTRIBUTION.—Mains, about 12 miles. Taps, 1,130; made by Co. at $8.25 for 1-in., $5.75 for ¾-in.; $4.75 for ⅝-in.; $4.25 for ½-in. Services, lead and galv. i.; paid for by property owner. Meters: 60; owned, controlled and repaired by Co. Use of meters compulsory for breweries, liveries, business blocks, etc. Co. can compel use of meters and any consumer may have one. Hydrants, public, 260. CONSUMPTION.—(Galls.) av., 1,500,000; max., 2,900,000; min., 900,000. PRESSURE.—Ordinary, 90 lbs.; fire, 125 lbs. MANAGEMENT.—Prest., L. G. Phelps; Secy., Treas., Supt. and Ch. Pump. Engr., E. W. King. Rept. by Supt., Aug. 20, '96. SEWERS.—Has sanitary and storm sewers.

10. **HELENA,** Lewis and Clarke Co. (13,834.) Now owned by Helena Consolidated Water Co.; organized July 1, '89. In '87-8 Helena Water Co. built works under 20-yr. franchise. Three other Cos. built works prior to '89 and in that year were consolidated. FRANCHISE.—20 yrs. from '89. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay for public service. LEGAL DIFFICULTIES.—Co. had a five years' contract with city which expired Jan., '95. City refused to continue old contract and the court will determine what is a reasonable price for the service. Press rept., Nov., '96, stated court had decided case in favor of Co., and that city would appeal. In '95, city proposed to buy out Co. Later, press repts. state, city took steps to build works, but was restrained by action brought by Co., court upholding state law compelling cities to buy out Co. plants before building works. SUPPLY.—Large springs, near city, and Ten Mile Creek, ten miles distant, by gravity to reservoirs and by pumping. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Blake high duty. RESERVOIRS.—Cap., 10,000,000 galls.; two 2,250,000 in city and two at head of pipe line on Ten Mile Creek, 5,000,000. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 57 miles; cost extensions met by treasury bonds in hands of Trust Co. Taps, 3,000; made by Co. at $2.50 to $5, according to size. Services, galv. i.; paid for by consumer. Meters: 180; owned, controlled and repaired by Co. Use of meters optional with Co.: compulsory for large consumers principally. Hydrants, public, 263. CONSUMPTION.—(Galls.) av., 4,000,000; max., 5,000,000; min., about 3,500,000. Large amount of water is used for irrigation. PRESSURE.—Ordinary, 60 to 100 lbs.; fire, 60 to 150 lbs. FINANCIAL.—Cost, $1,390,000. Cap. Stock: Authorized, $1,500,000; all paid-up. Bonded debt, $1,121,000: $881,000, at 6%, due in 1909; $240,000, due in 1898. Expenses, $19,000: Operating, $12,000; taxes, $7,000. Revenue: Consumers, about $70,000. For the first five years the city paid $2,000 per month for all purposes; nothing has been paid since contract expired, except a little on account. MANAGEMENT.—Secy., John B. Clayberg. Rept. by Prest., Wm. A. Chessman, Oct. 23, '96. SEWERS.—Has sanitary and storm sewers.

11. **KALISPELL,** Flathead Co. (Est., 2,000.) Built in '92 by Co. Engr., C. F. McLain. FRANCHISE.—Perpetual from '92; provides for purchase of works by city at expiration of 15 yrs. and every 5 yrs. thereafter. No legal difficulties. SUPPLY.—Well located on river bed and supplied by springs. PUMPS.—Cap., 1,000,000 (?) galls.; 2—500,000 Deane comp. dup. (makers rept. combined cap. of 3,380,000 galls.). Wood and slabs from saw mills used; av. cost, $1.25 and 95 cts. per cord. STAND-PIPE.—Cap., 183,600 galls.; 25 × 50 ft. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 6 miles. Taps, 207; made by Co. for $7.50. Services, ½ and ¾-in.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 4. CONSUMPTION.—(Galls.) av., 160,000. PRESSURE.—

Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—Bonded debt, $160,000, at 6%; due in 1912. MANAGEMENT.—Prest., J. A. Coram, Lowell, Mass.; Secy., A. M. Whitney; N. Y. City; Treas., J. F. Moffett, N. Y. City; Supt., R. D. Gould. Rept. by Gen. Mgr., F. B. Roblin, Dec. 14, '96. SEWERS.—Has sanitary and storm sewers.

12. **LIVINGSTON**, Park Co. (2,850.) Built in '90-1 by Livingstone Water-Works & Electric Light Co.; put in operation June, '91. Engr., Saml. Burdock. Contr., E. Sutphin, St. Louis, Mo. FRANCHISE.—20 yrs. from '91; provides for purchase of works by city. Rates are fixed in franchise. City to pay for use of water for sewers and public buildings. SUPPLY.—Yellowstone River, pumping to reservoir and direct; filtered through gravel into large well on bank of river. PUMPS.—Cap., 3,250,000 galls.: 2,000,000 Barr comp. dup.; 500,000 and 750,000 Deane. Bituminous lump coal used; av. cost, $1.85 per short ton. RESERVOIR.—Cap., 350,000 galls.; storage, 140 ft. above city. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 8 miles. Taps, 500; made by Co. for $13, including service to curb. Meters: 10; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for hotel, restaurants, liveries and saloons. Hydrants, public, 50; private, 6. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—Ordinary, 80 lbs.; fire, 125 lbs. FINANCIAL.—Including water and electric light plants. Cost, $100,000. Cap. Stock: Authorized, $50,000; paid-up, $10,000. Debt, $49,454. Expenses: Operating, $5,650. MANAGEMENT.—Prest., W. J. Anderson; Secy., E. C. Lay; Treas., Chas. Cousins; Ch. Pump. Engr., Jas. Blakey. Rept. by Supt., E. C. Ross, Sept. 26, '96. SEWERS.—None.

13. **MILES CITY**, Custer Co. (956.) Water and light plants bought by city in '95; built in '90 by Miles City Water & Electric Light Co. SUPPLY.—Artesian and surface wells, pumping direct. PUMPS.—Cap., 1,250,000 galls.; 1,000,000 Worthington and 250,000 Knowles. DISTRIBUTION.—Mains, 2 miles. Taps, 16. Hydrants, 15. PRESSURE.—Ordinary, 15 lbs.; fire, 100 to 150 lbs. FINANCIAL.—Cost, $16,000. Hydrant rental, $100. NOTE.—Above information from '90-1 Manual. NOTE.—Inquiry returned Aug. 10, '96, by L. M. Hayden, Supt., endorsed: "Please do not send requests for a report on the water and electric light plant, as we are not in any position to make such a report at this time."

14. **MISSOULA**, Missoula Co. (3,426.) Built in '83 by Missoula Water-Works & Mining Co. FRANCHISE.—Provides neither for control of rates nor purchase of works by city. SUPPLY.—Rattle Snake Creek, by gravity. RESERVOIR. — (In '89.) Cap., 40,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 12 miles. Taps, 550. Hydrants, public, 36. FINANCIAL.—Cost, $150,000. Cap. Stock, $100,000; paid no div'd in '95. Floating debt, $4,000. Expenses: Operating, $4,000; taxes, $1,200, included in operating expenses. Revenue, $20,000. MANAGEMENT.—Prest., F. T. Sterling; Vice-Prest., C. M. Crutchfield; Secy. and Treas., J. M. Keith; Mgr., T. T. McLeod. Rept. by Co., Oct. 1, '96.

15. **NEIHART**, Meagher Co. (Est., 1,280.) Built in or since '92; probably by Neihart Water Co.

16. **PHILLIPSBURG**, Granite Co. (Est., 1,058.) Built in '93 by M. & J. Kaiser Water Co.; put in operation in Oct. No Engr. nor Contr. FRANCHISE.—10 yrs. from '93; does not provide for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Springs, by gravity to reservoir. RESERVOIRS.—Cap., 150,000 galls.; distributing, 30 × 75 ft., × 10 ft. deep. DISTRIBUTION.—Mains, 5 miles; cost extensions met by cash. Taps, made by Co., free. Services, ¾ to 1¼-in.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 19. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 75 to 200 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $20,000; all paid-up; paid $6,000 div'd in '96. No debt. Expenses, $480: Operating, $200; taxes, $280. Revenue, $7,500. MANAGEMENT.—Prest., M. Kaiser; Secy., Treas. and Supt., John Kaiser. Rept. by H. Kaiser, Jan. 14, '97. SEWERS.—None.

—? **WALKERVILLE**, Silver Bow Co. (1,743.) Supplied in '90 by Mountain Water Co. No response to inquiries.

P 2. **WHITE SULPHUR SPRINGS**, Meagher Co. (640.) Projected in '96 by city. Engr., M. S. Parker, Great Falls. Supply, Spring Creek and well at creek, by gravity with 500-ft. head. 500,000-gall. reservoir to be added. Mains, 8 miles. Hydrants, public, 24. Rept. by Engr., Dec. 18, '96, No sewers.

GROUP VII.—SOUTHWESTERN STATES.

Water-Works Completed, in Process of Construction or Projected, in Missouri, Arkansas, Texas, Oklahoma, Colorado and New Mexico.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

MISSOURI.

1. **AURORA**, Lawrence Co. (3,482.) Built in '92 by Aurora Water Co.; put in operation in Apr. Engr., J. W. Nier, St. Louis. FRANCHISE.—20 yrs. from '92. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $3,735 per yr. for public service; contract for 20 yrs. LEGAL DIFFICULTIES.—After paying 1 yr. city refused further payment; Supreme Court holds contract good and city liable. City has paid promptly since. SUPPLY. — Spring River, pumping to stand-pipe and direct. PUMPS. — Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. Av. cost of fuel used: Coal, $1.35 per short ton; wood, $1.25 per cord. STAND-PIPE. — Cap., 132,000 galls.; 15 × 100 ft. FISCAL YEAR CLOSED Jan. 15. DISTRIBUTION.—Mains, 14¼ miles. Taps, 240; made by Co. for $4.50. Services, iron and galv. i.; paid for by property owner. Meters: 10; owned by consumer; controlled and repaired by Co. Use of meters optional with Co.; compulsory for mills, etc. Hydrants, public, 68. CONSUMPTION.—(Galls.) av., 250,000; max., 400,000; min., 190,000. PRESSURE.—Ordinary, 45 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $79,000. Cap. Stock: Authorized, $100,000; all paid-up; paid $2,880 div'd in '95. Debt, $60,400: Floating, $400; Bonded, $60,000, at 6%; due in 1912. Expenses, $5,383: Operating, $1,575; int., $3,600; taxes, $208. Revenue, $8,222: Consumers, $4,487; City, fire protection, $3,735. MANAGEMENT.—Prest., A. L. White, Peirce City; Supt., T. H. Lay; Ch. Pump. Engr., J. T. Hubbard. Rept. by Secy., M. T. Davis, June 24, '96. SEWERS.—Has sanitary sewers only.

2. **BETHANY**, Harrison Co. (1,105.) Water and electric light plant built since July, '94, by city. Des. Engr., A. A. Cassil. SUPPLY.—Pumping to stand-pipe. PUMP.—Cap., 500,000 galls. STAND-PIPE.—Cap., 84,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 4 miles. Hydrants, 16. FINANCIAL.—Bonded debt (in '94), for water and light plant, $30,000. MANAGEMENT.—Mayor, A. Reeves. NOTE.—Subject to revision; information mostly from call for bids.

3. **BOLIVAR**, Polk Co. (1,485.) Built in '94 by city. Engr., Chas. F. Sturtevant, St. Louis. Contr., Geo. W. Dudley, St. Louis. SUPPLY.—Springs, by pumping. PUMP.—Cap., 575,000 galls.; Deane dup. (rept. by makers). FINANCIAL.—Contract price, $11,267.

4. **BONNE TERRE**, Saint Francois Co. (3,719.) Built in '87 by St. Joe Lead Co. SUPPLY.—Big Run, pumping direct. PUMPS.—Cap., 1,500,000 galls.; Gordon. DISTRIBUTION.—A number of 6 to 8-in. mains run through portion of town for free use of people. Hydrants, 15. NOTE.—No rept. since '90-1 Manual.

5. **BOONVILLE**, Cooper Co. (4,141.) Built in '83 by Boonville Water Co. FRANCHISE.—20 yrs. from '83. Rates are fixed in franchise. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Missouri River, pumping to reservoirs and stand-pipe. PUMPS.—Cap., 2,400,000 galls.; 2—1,200,000 Smith-Vaile. Bituminous coal used; av. cost, $1.75 per short ton. FILTERS.—Sand. RESERVOIRS.—Cap.,

6,250,000 galls.; storage and distributing, 90 ft. above city, one 1,500,000, one 1,750,000 and one 3,000,000. TANK.—Cap., 60,000 galls.; on brick tower 45 ft. high. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by earnings. Taps, 300; made by Co. for $5. Services, galv. i. and lead; paid for by property owner. Meters: 10; owned and controlled by Co. Use of meters compulsory for largest consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 52; private, 2. CONSUMPTION.—(Galls.) av., 250,000; max., 600,000; min., 150,000. PRESSURE.—Ordinary, 40 to 65 lbs.; fire, 60 to 85 lbs. FINANCIAL.—Cost, $89,500. Cap. Stock: Authorized, $100,000; paid-up, $87,500. Bonded debt, $50,000, at 6%; due in 1903. Expenses, $8,454: Operating, $5,314; int., $3,000; taxes, $140. Revenue, $8,916: Consumers, unmetered, $4,824; metered, $972; City, fire protection, $3,120. MANAGEMENT.—Prest., Warner Whitlow; Secy., W. C. Culverhouse; Treas., John Cosgrove; Ch. Pump. Engr., H. Eagan. Rept. by Supt., R. Hadelich, July 6, '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, May 31, '84.

6. **BROOKFIELD**, Linn Co. (4,547.) Built in '90 by city. Contr., B. Q. Rusk. SUPPLY.—Open wells, pumping to stand-pipe and direct. PUMP—Cap., 850,000 galls.; Deane. Bituminous coal used; av. cost, 7 cts. per bushel. STAND-PIPE.—Cap., 93,000 galls.; iron; 12 × 110 ft. DISTRIBUTION.—Mains, 8 miles. Taps, 200; made by city for $1.25. Services, galv. i.; paid for by property owner. Meters: 27; owned, controlled and repaired by consumer. Use of meters compulsory for livery barns, saloons, restaurants and hotels. City can compel use of meters and any consumer may have one. Hydrants, public, 84; private, 1. CONSUMPTION.—(Galls.) av., 40,000; max., 50,000; min., 25,000. Ice plant uses about 15,000 galls. daily during three months of the year. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $33,500. Expenses: Operating, $12,000. MANAGEMENT.—Chn., G. S. Wilber; Ch. Pump. Engr., G. R. Wott. Rept. by Supt., W. H. Jenkins, Sept. 14, '96. SEWERS.—None.

7. **BRUNSWICK**, Charlton Co. (1,748.) Built in '94 by city; put in operation in Oct. Engr., P. C. Barney, Brooklyn, N. Y. Contrs., Franklin Electric Co., Kansas City. SUPPLY.—Grand River, pumping to stand-pipe and direct. PUMP.—Cap., 500,000 galls; Snow dup. Ardmore run of mine coal used; av. cost, $1.60 per short ton, f. o. b. STAND-PIPE.—Cap., 29,000 galls.; steel; 10 × 50 ft., on masonry foundation 16 ft. high. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by special fund. Taps, 27; made by city. Services, w. i.; paid for by consumer. Use of meters optional with consumer; compulsory for steam users. City can compel the use of meters and any consumer may have one. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 20,000; max., 35,000; min., 15,000. PRESSURE.—Ordinary, 70 lbs.; fire, 150 lbs. FINANCIAL.—Cost, approx., $13,500. Bonded debt, $10,000 at 4½%. Sinking Fund, $1,500. Expenses: Operating, $1,906. Revenue: Consumers, $220; street sprinkling, $75. MANAGEMENT.—Mayor, W. E. Perkinson. Rept. by Supt., G. H. Coppin, Nov. 3, '96. PROJECTED IMPROVEMENTS.—Plans have been prepared and bonds issued for a new infiltration well, 20 × 30 ft., to be built this fall. SEWERS.—Has storm sewers only.

8. **BUTLER**, Bates Co. (2,812.) Built in '91 by Butler Water & Light Co.; now Butler Water, Light & Power Co.; put in operation in Sept. FRANCHISE.—20 yrs. from '90; provides for purchase of works by city at end of 10 yrs., or at intervals of 5 yrs. thereafter. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $4,450 per yr. for public service. No legal difficulties. SUPPLY.—Miami Creek, pumping to reservoir, stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane comp. dup. Bituminous coal used; av. cost, $2 per short ton. FILTERS.—Cap., 1,750,000 galls.; gravity. RESERVOIR.—Cap., 2,000,000 galls. STAND-PIPE.—Cap., 115,000 galls.; steel; 14 × 100 ft., on masonry foundation. DISTRIBUTION.—Mains, 6 miles; cost extensions met in part by city paying $45 per yr. for one hydrant for every 500 ft. Taps, 250; made by Co. for $2. Services, lead and iron; paid for by property owner. Meters: 80; owned by Co. principally; controlled by Co.; repairs paid by owner; yearly rental, $2.50. Use of meters optional with Co. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 30,000; max., 50,000; min., 10,000. PRESSURE.—Ordinary, 40 lbs.; fire, 130 lbs. FINANCIAL.—Cost, about $75,000 for original plant, without extensions. Cap. Stock: Authorized, $100,000; paid-up, $75,000. Bonded debt, $70,000 at 6%; due in 15 yrs. Sinking Fund, none. Expenses, $6,300; Operating, $1,500; int., $4,200; taxes, $600. Revenue, $7,450: Consumers, $3,000; City, fire protection, $4,450. MANAGEMENT.—Secy., W. E. Walton; Treas., J. C. Clark; Supt., H. B. Robinson; Ch. Pump. Engr., O. E. Fairchild. Rept. by Prest., F. J. Tygard, June 12, '96. SEWERS.—None.

9. **CAPE GIRARDEAU**, Cape Girardeau Co. (4,297.) Built in '94-5 by Cape Girardeau Water, Light & Power Co.; put in operation in Mar. Engr., Isaac A. Smith, Chester, Ill. (or St. Louis). No Contr. FRANCHISE.—30 yrs. from '92. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $3,000 per yr. for public service. SUPPLY.—Mississippi River, through submerged filter-crib, pumping to reservoir. PUMPS.—Cap., 2,500,000 galls.; two Deane comp. dup. Av. cost of coal used, $2 per short ton. RESERVOIR.—Cap., 1,200,000 galls. DISTRIBUTION.—Mains, 7.3 miles. Hydrants, public, 75. MANAGEMENT.—Supt., R. E. Gannon. Rept. by Engr.

10. **CARROLTON,** Carroll Co. (3,878.) Built in '88 by Carroll Water-Works Co. Press repts. in '92 indicated works were then owned by Missouri Water, Light, Heat & Power Co. FRANCHISE.—20 yrs.; provides for purchase of works by city at expiration of franchise; price to be determined by arbitartion. Rates to be same as those of Kansas City. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 2,225,000 galls.: 1,000,000 Holly hor. dup; 1,225,000 Deane comp. dup. STAND-PIPE.—Cap., 93,000 galls.; 12 × 110 ft. DISTRIBUTION.—Mains, 2½ miles. Taps, 100. Meters, 4. Hydrants, 25. PRESSURE.—(In '88.) Ordinary, 80 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock, $50,000. Debt, $25,000, at 7%. Expenses: Operating, $3,000. Revenue: Consumers, $1,500; City, $2.340. NOTE.—No rept. since '90-1 Manual.

60. **CARTERVILLE,** Jasper Co. See Webb City.

11. **CARTHAGE,** Jasper Co. (7,981.) Built in '81-2 by Carthage Water-Works Co. FRANCHISE.—20 yrs. SUPPLY.—Spring River, pumping to stand-pipe and direct; filtered. PUMPS.—Cap., 1,500,000 galls.; 2 Knowles. FILTERS.—(In '89.) Stone and gravel, 25 × 50 × 12 ft. deep. Since last Manual filter of crushed tripoli stone has been added. STAND-PIPES.—Cap., 182,000 galls. Old: Cap., 30,000 galls.; iron, 8 × 80 ft., 70 ft. above city. New: Cap., 152,000 galls.; 20 × 65 ft., on 70-ft. substructure. DISTRIBUTION.—Mains, 14 miles. Taps, 750. Meters, 18. Hydrants, 68. PRESSURE.—(In '88.) Ordinary, 40 lbs.; fire, 118 lbs. FINANCIAL.—Withheld. NOTE.—No rept. since '90-1 Manual. REFERENCES.—Eng. News, Oct. 21, '82; filter of crushed stone, Feb. 7, '95.

12. **CHILLOCOTHE,** Livingston Co. (5,717.) Built in '87 by Chillicothe Water, Gas & Electric Light Co.; now owned by English bondholders (under name Chillicothe Water Co.?). In '89 works were in hands of receiver. Press repts. state receiver was again appointed in '94, and plant sold to bondholders for $25,000. FRANCHISE.—20 yrs. from '87; provides for purchase of works by city in '97, and at intervals of 5 yrs thereafter. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. SUPPLY.—Grand River, pumping through filters to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. Bituminous coal used; av. cost, $2 per short ton, delivered. FILTERS.—Cap., 300,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 126,000 galls.; 12½ × 140 ft. DISTRIBUTION.—Mains, 13 miles. Taps, 300; made for $2.50. Services, lead and iron; paid for by consumer. Meters: 63; owned, 35 by consumer, 28 by Co.; controlled and repaired by consumer. Use of meters optional with consumer; compulsory for large consumers. Hydrants, public, 129. CONSUMPTION.—(Galls.) av., 500,000; max., 550,000; min., 450,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cost, $225,000. Cap. Stock, paid-up, $250,000. Bonded debt, $145,000, at 6%. Expenses, $13,700: Operating and taxes, $5,000; int., $8,700. Revenue, $19,015: Consumers, $9,115; R. R., $3,000; City, $6,900. MANAGEMENT.—Prest., Newman Erb, 66 Broadway, New York City; Secy., Chas. F. Street, 44 Wall St., New York City; Supt., Van R. Caldwell; Ch. Pump. Engr., Geo. March. Rept. by Co., June 3, '96. SEWERS.—Has sanitary and storm sewers.

13. **CLINTON,** Henry Co. (4,737.) Bought at mortgage sale in '93 and reorganized as Home Water-Works Co.; built in '86 by Clinton Water Co. FRANCHISE.—20 yrs. from '85; does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Two artesian wells, pumping to stand-pipe and direct. First well 6⅛ ins. × 850 ft., flowing. PUMPS.—Cap., 1,800,000(?) galls.; 1,000,000 dup. and 800,000 comp. dup., Deane. Makers rept. instead, 3,500,000 dup. and 1,225,000 comp. dup., Deane, furnished in '92 and 94. Bituminous coal used; av. cost, $1.75 per short ton. FILTERS.—Cap., 700,000 galls. RESERVOIRS.—Cap., 2,800,000 galls.; two: 2,000,000 and 800,000. STAND-PIPE.—Cap., 65,000 galls.; ⅝ to 3-16-in. iron. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 7⅛ miles; cost extensions in '93 met by stockholders. Taps, 381; made by consumer, no fee. Services, galv. i. and lead; paid for by consumer. Meters: 36; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 66. CONSUMPTION.—(Galls.) av., 275,000; max., 460,000; min., 160,000. PRESSURE.—Ordinary, 75 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $93,000. Cap. Stock: Authorized, $100,000; paid-up, $93,000; paid no div'd in '95. Bonded debt, $75,000, at 6%. Sinking Fund, none. Expenses, $9,600: Operating, $5,100; int., $4,500; taxes, $172, included in operating expenses. Revenue, $10,100: City, fire protection, $4,100; other purposes, $6,000. MANAGEMENT.—Prest., W. L. Crow, New York; Secy., W. A. Foote; Treas., E. H. Mathewson, South Norwalk, Conn.; Ch. Pump. Engr., F. M. Bonham. Rept. by Supt., J. H. Sheldon, June 23, '96. SEWERS.—Has sanitary sewers only.

14. **COLUMBIA,** Boone Co. (4,000.) Built in '93 by Columbia Water & Light Co. Engr., Hiram Phillips, St. Louis. FRANCHISE.—20 yrs.; permits purchase of works by city at the expiration of 10, 15 and 20 yrs. Rates not to exceed the St. Louis rates for '92. SUPPLY.—Impounding reservoir on Huckson Creek, pumping direct. PUMPS.—Cap., 2,750,000 (?) galls.; two Deane, a comp. dup. and a dup. rept. by makers as furnished in '93; also 1,250,000 Worthington comp. non-cond. rept. by makers. FILTERS.—Western. DISTRIBUTION.—Mains, 6½ miles. Hydrants, 48. MANAGEMENT.—Supt., Jas. M. Sherman. Rept. mostly by Engr., in '94. REFERENCE.—Dam, Eng. News, June 7, '94.

P 1. **DEXTER**, Stoddard Co. (792.) City engaged Isaac A. Smith, Chester, Ill., in July, '96, to make plans for works.

15. **EXCELSIOR SPRINGS**, Clay Co. (2,034.) Built in '92, probably by Excelsior Springs Light & Water Co. Cy. Clk., C. H. Coppinger.

P 2. **FERGUSON**, Saint Louis Co. (Not given.) Co. or individual proposes to lay mains and buy water from St. Louis. Engr., Hiram Phillips, St. Louis. Mayor, J. E. Hereford. Rept. in Jan., '97.

16. **FULTON**, Callaway Co. (4,314.) Built in '88-9 by city. SUPPLY.—Two artesian wells, by gravity to reservoir for domestic use, and by direct pumping for fire protection. PUMPS.—(In '89.) Cap., 1,000,000 galls.; Deane dup. high pressure; also 300,000-Nelson deep-well. RESERVOIR.—Cap., 132,000 galls. STAND-PIPE.—Cap., 109,000 galls.; steel; 15 × 75 ft. DISTRIBUTION.—Mains, 3.7 miles. Taps (in '90), 111. Hydrants, public (in '90), 47. CONSUMPTION.—(Galls.) av. (in '90), 30,000. PRESSURE.—Ordinary, 75 lbs.; fire, 150 lbs. FINANCIAL.—Bonded debt, $3,000. Revenue, $2,700. MANAGEMENT.—Rept. by Mayor, W. E. Jameson, Sept. 22, '96.

17. **GLASGOW**, Howard Co. (1,781.) Built in '94-5 by city; put in operation Jan., '95. Engr., F. Wm. Raeder, St. Louis. Contrs., Jaeger & Blanchard, Rich Hill. SUPPLY.—Missouri River, pumping to stand-pipe and direct. PUMP.—Cap., 360,000 galls.; Blakelee Mfg. Co., Duquoin, Ill. Mine run bituminous coal used; av. cost, $1.60 per short ton. FILTERS.—Western (rept. by makers). STAND-PIPE.—Cap., 40,000 galls.; iron and steel (?); 14 × 35 ft. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 1 mile; cost extensions met by general revenue of city. Taps, 19; made by city for $3. Services; paid for by owner of property. Meters, 0. Hydrants, public, 20; private, 9. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 45 lbs.; fire, 82 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $6,000, at 6%. Sinking Fund: $612, at 4%. Expenses: Operating, $1,000. Deficits met from general revenue. MANAGEMENT.—Ch. Engr., of W.-W., S. L. Meyer; Ch. Pump. Engr., Wm. Clark. Rept. by Secy., H. Clay Cockerill, Aug. 25, '96. SEWERS—Has storm sewers.

18. **GRANT CITY**, Worth Co. (1,186.) Built in '96 by city; put in operation July 1. Engr., W. N. Van Liew, Manhattan, Kan. Contrs., Fairbanks, Morse & Co., Chicago, Ill. SUPPLY.—Well, 20 × 30 ft., pumping to tank. PUMP.—Cap., 120,000 galls.; driven by 15-HP. gasoline engine. TANK.—Cap., 30,000 galls.; wood; 16 × 20 ft., on steel trestle 55 ft. high. DISTRIBUTION.—Mains, 1 mile; cost extensions met by individuals. Taps, 30; made by city. Services, lead and iron; paid for by property owner. Meters: 1; owned by C., B. & Q. Ry.; any consumer may have a meter. Hydrants, public, 5; private, 2. CONSUMPTION.—(Galls.) av., 5,000. PRESSURE.—Ordinary and fire, 40 to 140 lbs. FINANCIAL.—Cost, $7,500. Bonded debt, $5,000, at 5%; due in 1902. Expenses: Operating, $150. MANAGEMENT.—Prest. and Supt., A. W. Kelso; Secy., Dr. S. C. Davidson; Treas., J. L. Dawson; Ch. Pump. Engr., W. S. Hull. Rept. by C. M. Harrison, Dec. 29, '96, and by Contrs., Dec., '96. SEWERS.—Has storm sewers only.

19. **HANNIBAL**, Marion Co. (12,857.) Built in '79-80 by Hannibal Water Co. FRANCHISE.—20 yrs.; provides for purchase of works by city at its expiration. Rates are fixed in franchise. SUPPLY.—Mississippi River, pumping to reservoirs. PUMPS.—Cap., 4,000,000 galls.; 1,500,000 Blake dup. and 2,500,000 Allis. RESERVOIRS.—Old: Cap., 1,500,000; 210 ft. above city; 230 ft. above low water in river. New: Cap., 16,000,000 galls.; 260 ft. above pumping station; built in '92-3. DISTRIBUTION.—Mains, 15.5 miles. Taps, 1,164. Meters, 44. Hydrants, 97. PRESSURE.—(In '88.) Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $172,000. Bonded debt (in '86), $105,000. Expenses: Operating, $9,600. Revenue, $23,740: Consumers, $17,780; City, fire protection, $5,660. NOTE.—No official report since '90-1 Manual. REFERENCE.—Eng. News, Feb. 25, '82.

20. **HIGGINSVILLE**, Lafayette Co. (2,342.) Built in '94 by city; put in operation June 2. Engr., Chas. F. Sturtevant, Bushnell, Ill. SUPPLY.—Well, pumping to reservoir and direct. Well is 10 × 80 ft., in porous sandstone. PUMPS.—Cap., 575,000 galls.; Deane comp. dup. Bituminous coal used; av. cost, $1.75 per short ton. RESERVOIR.—Cap., 80,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by general taxation. Taps, about 60; made by city for $7. Services, lead and iron; paid for by consumer. Meters: 15; owned, controlled and repaired by city. Use of meters compulsory for all large water users. City can compel the use of meters and any consumer may have one. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 25,000; min., 16,000. PRESSURE.—Ordinary, 55 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $18,000, at 6%; due 1914. Sinking Fund: $2,400, at 4%. Expenses, $4,100: Operating, $3,800; int., $300. MANAGEMENT.—Rept. by Supt., H. H. McDaniel, Aug. 31, '96, and by Engr., June, '96. SEWERS.—Has storm sewers.

21. **HOLDEN**, Johnson Co. (2,520.) Built in '87 by Holden Water-Works Co. Works sold for $40,500, in '89, under foreclosure of first mortgage bonds. FRANCHISE.—20 yrs., with privilege of renewal unless city buys works; provides for purchase of works by city at intervals of 10 yrs. Rates are fixed in franchise. SUPPLY.—Impounding reservoir, pumping through filter to stand-pipe. PUMP.—Cap., 1,000,000 galls.; Deane comp. dup. FILTERS.—Cap., 400,000 galls.; Hyatt (New York). STAND-PIPE.—Cap.; 75,000

galls.; 10 x 127 ft. DISTRIBUTION.—Taps, 110. Meters, 6. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 50,000. FINANCIAL.—Cost, $65,000. Bonded debt, $50,000, at 6%. Expenses, $4,800: Operating, $1,800; int., $3,000. Revenue, $5,100: Consumers, $2,100; City fire protection, $3,000. MANAGEMENT.—Prest. and Mgr., F. Hendrick, St. Louis. Rept. by Secy. and Treas., H. D. Hibbeler, Washington, Mo., Nov. 2, '96.

22. **INDEPENDENCE**, Jackson Co. (6,380.) Built in '83-4 by Independence Water-Works Co. FRANCHISE.—20 yrs. from '83; provides for purchase of works by city in '94. Rates are to be same as in neighboring cities mentioned. Co is not exempt from local taxes. City to pay $80 each per yr. for 50 hydrants. No legal difficulties. SUPPLY.—Missouri River, pumping to settling basins and thence repumping to stand-pipe; direct pumping for fire. PUMPS.—Dean (Deane?) and Gordon; 1,000,000 Smith-Valle. Cherokee slack and run of mine coal used; av. cost, $1.60 per short ton. FILTERS.—Cap., 200,000 galls.; Hyatt (New York). RESERVOIR.—Cap., 1,000,000 galls.; storage and settling, located at river. STAND-PIPE.—Cap., 250,000 galls.; steel; 18 x 120 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by bonds principally. Taps, 450; made by consumer. Services, iron and lead; paid for by property owner. Meters: 55; owned by Co. or consumer; controlled by Co.; repaired by owner. Use of meters compulsory for factories, mills, R. Rs., livery stables and laundries. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 250,000; max., 400,000; min., 150,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, about $100,000. Cap. Stock: Common, authorised, $50,000; all paid-up; paid no div'd in '95. Pref'd, authorized, $53,000; about all paid-up; 5% div'd guaranteed. Bonded debt, $30,000, at 5%; due in 1914. Sinking Fund, none. Revenue, $9,856: Consumers, unmetered, $3,218; metered, $2,638; City, fire protection, $4,000. MANAGEMENT.—Prest. E. P. Kimball. Rept. by Supt., R. D. Wirt, June 4, '96. SEWERS.—None. REFERENCE.—Eng. News, Mar. 7, '85.

23. **JEFFERSON CITY**, Cole Co. (6,742.) Built in '88 by Jefferson City Water-Works Co. FRANCHISE.—15 yrs. from '88 with option of purchase of works by city at expiration of franchise and every 5 yrs. thereafter. Rates are fixed in city ordinance and are not to be higher than in other places on Missouri River. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Missouri River, pumping to reservoir, thence repumping to stand-pipe. PUMPS.—Cap., 1,250,000 (?) galls.; Gordon. In '89, 4—1,000,000 Gordon pumps were rept., two for high and two for low service; makers also rept. 4,000,000 Gordon furnished in '88. Cannel coal used; av. cost, $2.25 per short ton. RESERVOIRS.—Cap., 1,600,000 galls.; 2—800,000. STAND-PIPE.—Cap., 300,000 galls.; 20 x 125 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8 miles. Taps, 300; made by Co. Services, iron and lead; paid for by consumer. Meters: 45; owned by consumer. Use of meters optional with consumer; compulsory for large consumers. Hydrants, public, 74; private, 5. CONSUMPTION.—(Galls.) av., 450,000. PRESSURE.—Ordinary, 70 lbs.; fire, 85 to 125 lbs. FINANCIAL.—Cost, $140,000. MANAGEMENT.—Prest., F. H. Binder; Secy., W. A. Dallmeyer; Ch. Pump. Engr., H. Keiser. Rept. by Supt. and Treas., J. W. Edwards, June 3, '96. SEWERS.—Has sanitary and storm sewers.

24. **JOPLIN**, Jasper Co. (9,943.) Built in '80 by Joplin Water-Works Co. FRANCHISE.—20 yrs.; provided for purchase of works by city any time after 10 yrs., but city has waived right for 10 yrs. Rates are fixed by city ordinance. LEGAL DIFFICULTIES.—Press rept. states that in '93 State Court of Appeals affirmed judgment of lower court, granting mandamus to compel Co. to supply water through a meter furnished by consumer. Co. refused to supply water except at fixture rates. SUPPLY.—Shoal Creek, pumping to reservoir and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Deane comp. dup. cond. Run of mine bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 3,000,000 galls.; 220 ft. above pumps, 82 ft. above city. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 24 miles; cost extensions met by earnings. Taps, 1,400; made by Co. for $3. Services, lead and iron; paid for by consumer. Meters: 49; owned by Co. and consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 153. PRESSURE.—Ordinary, 30 lbs.; fire, 110 lbs. FINANCIAL.—Cap. Stock: Authorized, $250,000; all paid-up. Bonded debt, $185,000, at 6%. Expenses, $20,553: Operating, $8,183; int., $11,550; taxes, $820. Revenue, $27,437: Consumers, $16,973; metered, $2,969; City, fire protection, $7,246; other purposes, $249. MANAGEMENT.—Prest., Thos. Connor. Rept. by Supt. and Secy., C. W. Glover, July 6, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, June 3, '82.

25. **KANSAS CITY**, Jackson Co. (119,668, excluding 13,048, which were included in enumeration of pop. by '90 Census, but which have since by decision of the Supreme Court of state been decided to be without the limits of the city.) Bought by city Sept. 1, '95; built in '73 by National Water-Works Co. LEGAL DIFFICULTIES.—Four years' litigation resulted in city buying the plant. SUPPLY.—Missouri River, pumping from supply station, five miles above city, to reservoirs. PUMPS.—Two Pearson-Gaskill 11,000,000 (not stated whether each or both together); 15,000,000 Worthington; 9,000,000 and 4,000,000 Holly-Gaskill hor. high duty; 4,000,000 and 3,000,000 Holly quadruplex. Contract was let in Oct., '96, for a 10,000,000-gall. Barr (?) high duty pump. Bituminous slack used; av. cost, $1.25 per short ton. RESERVOIRS.—Cap., 88,000,000 galls.: Settling, 60,000,000 at supply station. Distributing, 19,000,000. High service, 9,000,000, elev. 252

ft. FISCAL YEAR CLOSED Apr. 20. DISTRIBUTION.—Mains, 138.7 miles; cost extensions met by rentals. Taps, 12,000; made by city. Services, galv. i.; paid for by consumer. Meters: 3,200; owned by city and consumers; controlled and repaired by city; not rented. City can compel use of meters and any consumer may have one. A large number of meters are in residences. Hydrants, public, 1,442; private, no record, perhaps 100. CONSUMPTION.—(Galls.) av.,11,000,000; max., 18,000,000; min., 8,000,000. PRESSURE.—Ordinary, 130 lbs.; fire, 175 lbs. Seven steam fire engines are owned but little used. FINANCIAL.—Bonded debt, $3,000,000, at 4½%; due in 20 yrs. MANAGEMENT.—Prest., W. Comrs., Peter H. Tiernan; Ch. Clk., C. E. Rickert; Supt., D. W. Longwell; Ch. Pump. Engr., Jas. Chapman. Rept. by Water Dept., Oct., 19, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—General: Eng. News, July 2, '81; Nov. 5, 12, '26, Dec. 3, 17, 24, '87; reports, Apr. 21, '77, Aug. 6, '81.

26. **KIRKSVILLE**, Adair Co. (3,510.) Built in '94 by city; put in operation Nov. 1. Engr. and Contr., Thos. V. Hall, St. Louis. SUPPLY.—Well, 1,300 ft. deep, pumping to reservoir and repumping direct. PUMPS.—Cap., 750,000 galls.; Gardner dup. deep well and 750,000 dup. Bituminous coal used; av. cost, $1.50 per short ton. RESERVOIR.—Cap., 145,000 galls. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 4½ miles. Taps, 125; made by consumer; no fee. Services, galv. i.; paid for by consumer. Meters, 0. Meters were to be introduced by city within 60 or 90 days. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 40,000; max., 60,000; min., 20,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Debt, $30,000: Floating, $10,000, at 6%; Bonded, $20,000, at 5%; due in 20 yrs. or at option every 5 yrs. Sinking Fund: $2,400, invested in real estate. Expenses, $4,200: Operating, $3,206, int., $1,000. Surplus of $1,000 last year over expenses. MANAGEMENT.—Mayor, W. E. Nonan; Supt., Stephen Hall; Ch. Pump. Engr., Fred. Darrow. Rept. by Ch. Pump. Engr., June 13, '96. SEWERS.—Has partial sanitary system only.

P 3. **KIRKWOOD**, Saint Louis Co. (1,777.) Meramec Highlands Co. secured franchise in '95, and has secured several extensions of time for beginning construction, latest being six months from Nov., '96. Supply, Meramec River, pumping to stand-pipe. Prest., M. A. Bernheimer, St. Louis.

27. **LAMAR**, Barton Co. (2,860.) Built prior to '93 by Lamar Water & Electric Light Co. LEGAL DIFFICULTIES.—Press repts. state Missouri Supreme Court has twice declared that city exceeded its debt limits in contracting for hydrants. PUMPS.—Cap., 1,000,000 galls.; two Deane comp. dup. (rept. by makers as furnished in '90). FILTERS.—Cap., 750,000 galls.; New York (rept. by makers as started Dec., '91).

28. **LEBANON**, Laclede Co. (2,218.) Built in '90 by Lebanon Light & Water Co. Press rept. states property of Co. was sold under foreclosure in Nov., '95. FRANCHISE.—20 yrs. SUPPLY.—Artesian well, 1,000 ft. deep, pumping to stand-pipe. STAND-PIPE.—Cap., 85,000 galls.; 12½ × 100 ft. DISTRIBUTION.—Hydrants, 12. FINANCIAL.—Withheld. NOTE.—No rept. since '90-1 Manual.

29. **LEXINGTON**, Lafayette Co. (4,587.) Built in '84-5 by Lexington Water Co. FRANCHISE.—20 yrs. from '84; provides for purchase of works by city at intervals of 5 yrs. after '94. City to pay $4,000 per yr. for public service. No legal difficulties. SUPPLY.—Missouri River, pumping to settling reservoirs, thence repumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Blake. Bituminous coal used; av. cost, $1.75 per short ton. RESERVOIRS.—Cap., 2,000,000 galls. STAND-PIPE.—Cap., 350,000 galls.; 19½ × 152 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 7 miles. Taps, 458; made by Co. for $4.50. Services, ¾-in galv. i.; paid for by consumer. Meters: 6; owned and controlled by Co. Use of meters optional with Co. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 228,000. PRESSURE.—Ordinary, 65 lbs.; fire, 120 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $75,000, at 6%. Expenses: Int., $4,500. Revenue, $9,150: Consumers, $5,000; City, fire protection, $4,000; street sprinkling, $150. MANAGEMENT.—Prest., W. G. McCausland; Secy., Jas. Wentworth. Rept. by Supt., L. C. Yates, Sept. 22, '96. REFERENCE.—Stand-pipe failure, Eng. News, June 27, '85; Oct. 6, '88; Apr. 12, '94.

30. **LOUISIANA**, Pike Co. (5,090.) Built in '87-8 by Louisiana Water Co.; controlled by American Water-Works & Guarantee Co., Ltd., Pittsburg, Pa. FRANCHISE.—Provides for purchase of works by city in '97, and at intervals of 5 yrs. thereafter, price to be determined by arbitration. Rates are fixed in franchise. SUPPLY.—Mississippi River, pumping through mains to reservoir; filtered. PUMPS.—Cap., 2,250,000 galls.; 2—750,000 Walker and 750,000 Deane. FILTERS.—Cap., 300,000 galls.; National (New York). RESERVOIR.—Cap., 2,000,000 galls.; distributing, 305 ft. above low water in river. DISTRIBUTION.—(In '90.) Mains, 6 miles. Taps, 231. Meters, 3. Hydrants, 55. PRESSURE.—Ordinary and fire, 120 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa.; Secy., A. E. Claney; Treas., E. B. Fogle; Supt., S. B. Culver. Rept. Gen. Mgr., W. S. Kuhn, Pittsburg, Pa.

31. **MACON**, Macon Co. (3,371.) Built in '90-1 by city; put in operation Feb. 1. SUPPLY.—Impounding reservoir on East Fork of Shariton River, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Deane dup. RESERVOIR.—Cap., 60,000,000 galls. DISTRIBUTION.—Mains, 3½ miles. Hydrants, 10. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $25,000 at 6%. NOTE.—No rept. since '90-1 Manual.

P 4. **MALDEN,** Dunklin Co. (943.) Bids for water and electric plants to be owned by city, were to be received Feb. 8, '97. Mayor, G. W. Peck.

32. **MARSHALL,** Saline Co. (4,297.) Built in '85 by Marshall Water Co. FRANCHISE.—20 yrs.; provides for purchase of works by city at any time. Rates are fixed in franchise. SUPPLY.—Wells, pumping direct. PUMP.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington; a comp. non-cond. and a simple high pressure. Bituminous coal used; av. cost, $2.25 per short ton. FISCAL YEAR CLOSED Jan. 9. DISTRIBUTION.—Mains, 5 miles; cost extensions met by rentals. Taps, 200; made by consumer, no fee. Services, iron and lead; paid for by consumer. Meters: 14; owned, controlled and repaired by Co. Use of meters compulsory for hotels, stables and mills. Co. can compel use of meters and any consumer may have one. Hydrants, public, 74. CONSUMPTION.—(Galls.) av., 275,000; max., 437,000; min., 210,000. PRESSURE.—Ordinary, 65 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $85,000. Cap. Stock: authorized, $75,000; all paid-up; paid no div'd in '95. Bonded debt, $71,000 at 6%; due 1904. Expenses, $8,565: Operating, $3,700; int., $4,594; taxes, $271. MANAGEMENT.—Prest., John R. Hall; Ch. Pump. Engr., John Peck. Rept. by Secy., Supt. and Treas., E. R. Page, June 4, '96. SEWERS.—None.

33. **MARYVILLE,** Nodaway Co. (4,037.) Built in '86 by Municipal Investment Co.; now owned by Maryville Water Co. Enlarged in '93. FRANCHISE.—Exclusive: 20 yrs. from '86; provides for purchase of works by city in '95 and at intervals of 5 yrs. thereafter. Max. rates are fixed in contract with city. Co. is not exempt from local taxes. City to pay $68 each per yr. for first 50 hydrants and $50 for each additional. LEGAL DIFFICULTIES.—City enjoined the Co. from building new water tower in city limits, June 16, '93; Circuit Court dissolved the injunction June 30 and tower was built. SUPPLY.—One Hundred and Two River, pumping to settling basin and repumped to tank and direct. PUMP.—Cap., 1,500,000 galls.; Smith-Vaile. A Leffel turbine wheel, located 300 ft. from pumping station, supplies power for pumping to settling reservoir. Bituminous coal used; av. cost, $1.95 per short ton. FILTER.—Cap., 500,000 galls.; gravity. RESERVOIR.—Cap., 20,000,000 galls. TANK.—Cap., 120,000 galls.; 18½ × 60 ft.; steel; on brick tower 48(?) ft. diam., 95 ft. high, the whole encased in brick tower with a space of 2 ft. between tank and wall. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 9½ miles; cost extensions met by issue of bonds. Taps, 433; made by Co. at $4.50 for ½-in., $5 for ⅝-in., $5.50 for ¾-in. Services, galv. i. and lead; paid for by consumer. Meters, 191; owned, 139 by consumers, 52 by Co.; controlled by Co.; repaired by consumer. Use of meters compulsory for business houses, manufactories, hotels, etc. Co. can compel use of meters and any consumer may have one. Hydrants, public, 58. CONSUMPTION.—(Galls.) av., 287,671; max., 290,000; min., 120,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $140,000. Cap. Stock: Authorized, $200,000; paid-up, $125,000; paid no div'd in '95. Debt, $146,243: Bonded, $125,000, at 6%, due in 1906; other debts, $21,243. Sinking Fund, none. Expenses, $10,351: Operating, $4,072; int., $5,697; taxes, $582. Revenue, $15,181. MANAGEMENT.—Prest., Wm. O. Cole, Chicago; Ch. Pump. Engr., O. H. Townsen. Rept. by Secy., Treas. and Supt., C. P. Denny, Oct. 6, '96. SEWERS.—Has sanitary sewers only. REFERENCES.—Stand-pipe failure from anchor ice, Eng. News, Mar. 9, 30, '93, May 10, '94, illus.

—? **MEMPHIS,** Scotland Co. (1,780.) Makers rept. 8 × 10-in. Goulds pump, driven by electric motor.

34. **MERAMEC HIGHLANDS,** Saint Louis Co. (Not given.) Built in '93 by Meramec Highlands Co. Engr., Chas. H. Ledlie, Rialto Bldg., St. Louis. Town is a summer resort about 19 miles from St. Louis and plant supplies only hotel and cottages on grounds of Co.; charge for such service being included in rental of cottages. SUPPLY.—Driven wells and auxiliary pumping from Meramec River, pumping to tank and direct. PUMP.—Cap., 750,000 galls.; Gordon dup. high-pressure. TANK.—Cap., 16,000 galls.; wood, on trestle. DISTRIBUTION.—Mains, 1¾ miles. Services, galv. i. Meters, 0. Hydrants, 13. PRESSURE.—Ordinary, 30 lbs.; fire, 100 lbs. MANAGEMENT.—Rept. by Maxime Reber, Rialto Bldg., St. Louis, Jan. 14, '97. SEWERS.—Has sewers.

35.—**MEXICO,** Audrain Co. (4,789.) Built in '84-5 by Mexico Water-Works Co. FRANCHISE.—20 yrs. from '89; does not provide for purchase of works by city. Co. is not exempt from local taxes. SUPPLY.—Artificial lake and deep well, pumping to reservoir and direct. PUMPS.—Cap., 875,000 galls.; Blake, 750,000 for domestic and 125,000 for fire protection. Bituminous coal used; av., cost, 8 cts. per bushel. FILTER.—Cap., 1,000,000 galls.; Jackson (Western). A 300,000 National (New York) previously rept. RESERVOIR.—Cap., 50,000,000 galls. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by cash payments. Taps, 200; made by Co. for $5. Services, iron; paid for by consumer. Meters: 20; owned, controlled and repaired by Co. Use of meters compulsory for consumers of doubtful consumption. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 1. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—(In '87.) Cost, $80,000. Cap. Stock: authorized, $20,000; all paid-up; paid no div'd in '95. Bonded debt, $60,000 at 4½%; due in 20 yrs. Expenses, $7,750: Operating, $5,000; int., $2,500; taxes, $250. Revenue, $7,750: Consumers, $5,000; City, fire protection, $2,500; street sprinkling, $250. MANAGE-

MENT.—Prest., Geo. B. Macfarlane; Ch. Pump. Engr., John M. Dyke. Rept. by Secy., Treas., and Supt., Jno. J. Steele, July 6, '96. PROJECTED IMPROVEMENTS.—Filter and deep well pump are being added and a tank for washing filters. SEWERS.—Has partial sanitary sewers.

36. **MOBERLY,** Randolph Co. (8,215.) Built in '85 by Moberly Water-Works Co. Works were ordered sold June 1, '91, under foreclosure; press repts. indicate bondholders secure control. FRANCHISE.—20 yrs. from '85; provides for purchase of works by city after first 10 yrs. and at end of every 5 yrs. thereafter. Rates are subject to regulation of city. Co. is not exempt from local taxes. City to pay $5,500 per yr. for public service. SUPPLY.—Creek and wells. There are two 500-ft. wells, with daily supply of 210,000 and 240,000 galls. PUMPS.—Cap., 1,250,000 galls.; two Worthington, 500,000 comp. non-cond. for domestic service and 750,000 fire pump for fire protection. Also Downie double acting deep well. Av. cost of coal used, $1.62½ per short ton. RESERVOIRS.—Cap., 250,150,000 galls: Impounding, 250,000,000; area, 33 acres. Receiving, 150,000. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 6¾ miles; cost extensions met by guaranteed revenue for one yr. for every 500 ft. laid. Taps, 499; made by Co. for $1 to $1.50. Services, lead and galv. i.; paid for by consumer. Meters: 101; owned and repaired by consumers; controlled by Co. Use of meters compulsory for factories and Ry. Co. can compel use of meters and any consumer may have one. Hydrants, public, 65; private, 5. CONSUMPTION.—(Galls.) av., 410,000; max., 700,000; min., 395,000. PRESSURE.—Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—Cap. Stock: authorized, $100,000. Bonded debt, $100,000 at 6%. MANAGEMENT.—Prest., A. O. Headley, Newark, N. J.; Supt., H. V. Estill. Rept. by Secy. and Treas., Chas. C. Mackay, Bay Ridge, N. Y., July 13, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 20, '96.

37. **MONETT,** Barry Co. (1,699.) Built in '92 by city. Proposal advertisement called for two deep-well pumps, 20 × 50-ft. stand-pipe, 14,500 ft. mains and 23 hydrants. Cy. Clk., R. A. Gardner.

38. **MOUND CITY,** Holt Co. (1,193.) Built in '90-1 by city; put in operation Feb. 1. SUPPLY.—Four tube wells, 6 ins. × 88 ft., pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Deane comp. dup. STAND-PIPE.—Cap., 35,000 galls.; 10 × 60 ft., on hill 165 ft. above business portion of city. DISTRIBUTION.—Mains, 2 miles. Hydrants, 16. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $14,000. Bonded debt, $14,000, at 6%. NOTE.—No rept. since '90-1 Manual.

P 5. **MOUNT VERNON,** Lawrence Co. (782.) City proposes to build works in '97. Supply, spring near city, pumping to stand-pipe. Est. cost, $15,000. Rept. by citizen, Dec. 14, '96. Press rept. Feb., '97, stated $16,000 water bonds had just been sold.

39. **NEOSHO,** Newton Co. (2,198.) Built in '91 by Neosho Water-Works Co.; stock largely owned by Bay City (Mich.) Pipe Co.; put in operation in Dec. FRANCHISE.—20 yrs. from '91. Rates are subject to regulation by city ordinance. Co. is not exempt from local taxes. City to pay $40 per yr. per hydrant. LEGAL DIFFICULTIES.—City refused to pay hydrant rental because of failure of Co. to comply with ordinance; decision is expected in Missouri Supreme Court Jan., '97. Press rept., Dec., '96, stated court had decided city must pay rental. SUPPLY.—Elm Spring, from storage reservoir. Springs are 5 miles from and 137 ft. above city. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 12 miles. Taps, 250; made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 80. PRESSURE.—Ordinary and fire, 50 to 60 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: Authorized, $50,000; all paid-up; paid no div'd in '95. No debt. MANAGEMENT.—Prest., S. V. Saleno; Secy. and Treas., H. B. Smith; both of Bay City, Mich.; Supt., C. Baaye. Repts. by Supt. and by Jno. M. Sherwood, Chf. Fire Dept., Dec. 14, '96. SEWERS.—None.

40. **NEVADA,** Vernon Co. (7,262.) Built in '85 by Nevada Water Co. Receiver was appointed in May, '91; in '95 press rept. stated works were in hands of receiver. FRANCHISE.—10 yrs. from '96. City to pay $4,500 per yr. for public service. SUPPLY.—Marmaton River and wells, pumping to reservoir and direct. PUMPS.—Cap., 4,000,000 galls.: 2—1,000,000 Deane and 2—1,000,000 Smith-Vaile. Bituminous coal used; av. cost, $1.10 per short ton. FILTER.—Sand (apparently small). RESERVOIR.—Cap., 2,000,000 galls. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 26 miles. Taps, 602. Services, lead; paid for by consumer. Meters, 75; owned by Co. and consumer; controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 80. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—Ordinary, 23 lbs.; fire, 150 lbs. FINANCIAL.—Cap. Stock: Authorized, $200,000. Bonded debt, $150,000, at 6%. MANAGEMENT.—Rept. by Supt., C. F. Strohm, June, '96.

P 6. **OREGON,** Holt Co. (948.) Town voted $25,000 bonds for works in Mar., '95, but was unable to sell them. Stand-pipe proposed. Rept. by D. A. Young, Aug. 30, '96.

P 7. **OZARK,** Christian Co. (490.) Franchise for 20 yrs. granted latter part of '96 to Jno. C. Rogers, Ozark. Rept. by J. B. Williams, Cy. Clk., Jan., '97.

P 8. **PACIFIC,** Franklin Co. (1,184.) City hopes to build works in '97. Preliminary plans have been made by W. H. Bryan, Turner Building, St. Louis. Supply, Mera-

mec River, lifted by 750,000-gall. dup. pump to 500,000-gall reservoir. Hydrants, 26. Est. cost, $15,000. Rept. by Engr., Nov. 18, '96.

41. **PALMYRA,** Marion Co. (2,515.) Built in '90-1 by Palmyra Light & Water Co.; put in operation Feb. 1. FRANCHISE.—20 yrs. SUPPLY.—Springs, collected in reservoir and river, pumping to stand-pipe and direct. PUMP.—Cap., 850,000 galls.; Deane dup. (cap. rept. by makers). STAND-PIPE.—Cap., 100,000 galls. DISTRIBUTION.—Mains, (in '90), 4 miles. Hydrants, public, 41. PRESSURE.—(In '90), Ordinary, 90 lbs.; fire, 140 lbs. FINANCIAL.—Cap. Stock (in '90), $50,000. Revenue, $2,550. MANAGEMENT. —Rept. by Supt., H. T. Gulligan, Sept. 22, '96.

42. **PIERCE CITY,** Lawrence Co. (2,511.) Built in '88 by J. Guinney. SUPPLY.—Guinney's Lake, by gravity to stand-pipe. STAND-PIPE.—Cap., 100,000 galls.; 15 × 75 ft. DISTRIBUTION.—Mains, 6 miles. Hydrants, 25. FINANCIAL.—Cost, $45,230. Bonded debt, $25,000, at 6%. Expenses, $2,460: Operating, $960; int., $1,500. Revenue, $3,290: Consumers, $1,540; City, $1,750. NOTE.—No rept. since '89-90 Manual.

43. **POPLAR BLUFFS,** Butler Co. (2,187.) Built in '95 by city; put in operation in Mar. Engr., Isaac A. Smith; Contrs., Geo. W. Dudley & Co.; both of St. Louis. SUPPLY.—Black River, running through center of city, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.: 2—750,000 Worthington comp. non-cond. Bituminous nut coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 158,000 galls.; iron; 15 × 120 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 4 miles; cost extensions met by consumers and city refunds in water. Taps, 168; made by city at $6 for ½-in., $7 for ¾-in., $8 for 1-in. Services, lead; paid for by property owner. Meters, 1; owned and controlled by city. Use of meters optional with city; compulsory for factory. Hydrants, public, 43. CONSUMPTION.—(Galls.) av., 60,000; max., 85,000; min., 30,000. PRESSURE.—Ordinary, 51 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $20,000, at 6%; due in 1914. Sinking Fund, $2,000. Expenses, $3,200: Operating, $2,000; int., $1,200. Revenue: Consumers, $2,100. MANAGEMENT.—Rept. by Cy. Clk., J. B. Reynolds, June 26, '96. SEWERS.—Has storm sewers only.

44. **PRINCETON,** Mercer Co. (1,410.) Built in '96 by city; put in operation Nov. 1. SUPPLY.—Wells, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Gardner dup. STAND-PIPE.—Cap., 42,000 galls.; 12 × 50 ft. FINANCIAL.—Bonds voted, $16,500, for water and electric light plants.

45. **RICH HILL,** Bates Co. (4,008.) Built in '83; owned since July 1, '90, by Rich Hill Water, Light & Fuel Co. FRANCHISE.—20 yrs. from '83; provides for purchase of works by city in '93, '98 and 1903. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $90 each per yr. for 50 hydrants. No legal difficulties. SUPPLY.—Marais des Cygnes River, three miles distant, to well, thence pumping direct. PUMPS.—(In '89.) Cap., 1,000,000 galls.; Blake. Run of mine bituminous coal used; av. cost, $1.25 per short ton. FILTER.—Cap., 200,000 galls. New York; a 1,000,000 Hyatt (New York) was rept. as installed here in '86. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 10 miles. Meters owned and controlled by Co. Use of meters optional with consumer. Hydrants, public, 50; private, 2. CONSUMPTION.—(Galls.) av., 240,000; max., 2,000,000; min., 150,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cap. Stock: Authorized, $130,000; all paid-up; paid no div'd in '95. Bonded debt, $120,000. Expenses, $11,967: Operating, $9,287; int., $2,000; taxes, $680. Revenue: City, fire protection, $4,500; sewer flushing, $120. Works are combined with gas and electric light plants and expenses and receipts as given are for all. MANAGEMENT.—Prest., Jno. P. Keiser; Secy., Wm. C. Little; Supt., Ed. James; Ch. Pump. Engr., J. R. Loyd. Rept. by Treas., Wm. F. Lygard, June 6, '96. SEWERS.—None. REFERENCE.—Eng. News, Sept. 13, '84.

46. **RICHMOND,** Ray Co. (2,895.) Under construction '96-7 by city; to be completed before May 1, '97. Engr., Wynkoop Kiersted, Kansas City. Contrs., Seckner Construction Co., Chicago. SUPPLY.—Driven wells, pumping to reservoir and stand-pipe. Wells are 8 ins. × 58 ft., extending into 28-ft. bed of coarse river sand. PUMP.—Cap., 1,000,000 galls.; Worthington. Av. cost of coal used, $1 to $1.25 per short ton. RESERVOIR.—Cap., 80,000 galls.; storage, for fire protection, located at source of supply. STAND-PIPE.—Cap., 118,000 galls.; steel; 15 × 90 ft. DISTRIBUTION.—Mains, 8.4 miles. Hydrants, public, 60. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Contract price, $42,102. Rept. by Engr. SEWERS.—None.

47. **ROCKPORT,** Atchison Co. (934.) Built in '92 by city. SUPPLY.—Deep well, pumping to stand-pipe. PUMP.—Cap., 570,000 galls.; Deane dup. Wood used; av. cost, $2 per cord. STAND-PIPE.—Cap., 39,000 galls.; 15 × 30 ft. on hill 150 ft. above power house. DISTRIBUTION.—Taps, 25. Hydrants, public, 13. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—Ordinary, 80 lbs. Steam fire engines are used. FINANCIAL. —Cost, $17,000. Bonded debt, at 6%. Expenses: Operating, $2,160. MANAGEMENT.—Prest., M. Mayor. Rept. by Supt., J. H. Hedgpeth, July 25, '96. SEWERS.—None.

48. **SAINT CHARLES,** Saint Charles Co. (6,161.) Built in '81 by St. Charles Water & Heating Co. FRANCHISE.—20 yrs.; provides for purchase of works by city in 10 yrs. Rates subject to regulation by city. SUPPLY.—Missouri River, pumping to settling tanks, thence by repumping to stand-pipe and direct. PUMPS.—Cap., 4,225,000 (?) galls.: Makers rept. 3—1,000,000 Worthington comp. non-cond. and 1,225,000 Deane

dup. SETTLING TANKS.—Cap., 860,000 galls.; two, plate iron, each 70 × 15 ft., set on masonry bed 80 × 60 ft., on edge of bank 10 ft. above high water. STAND-PIPE.—Cap., 250,000 galls.; ⅝ to ¼-in. steel, 25 × 70 ft.; enclosed with masonry and covered. Engr., Edw. Flad, St. Louis. Built in '95 on site of 20 × 16-ft. wood tank, resting on 40-ft. brick tower, which latter failed. DISTRIBUTION.—Mains, 7.5 miles. Taps, 340. Hydrants, 40. FINANCIAL.—(In '88.) Cost, $80,000. Cap. Stock, $80,000. No debt. NOTE.—No rept. since '90-1 Manual. REFERENCES.—Eng. News, Mar. 18, '82; stand-pipe, Aug. 8, '95, illus.

49. **SAINT JOSEPH,** Buchanan Co. (52,324.) Built in '80 by St. Joseph Water Co.; now controlled by the American Water-Works & Guarantee Co., Pittsburg, Pa. FRANCHISE.—20 yrs.; provides for purchase of works by city in 1900, price to be determined by arbitration. Rates are fixed in franchise. SUPPLY.—Missouri River, pumping to settling and distributing reservoir. PUMPS.—Cap., 16,000,000 galls.; 3,000,000, Wilson-Snyder; 4,000,000 and 3,000,000 Worthington comp. cond.; 6,000,000 Holly-Gaskill hor. high duty. RESERVOIR.—Cap., 16,000,000 galls. DISTRIBUTION.—Mains, 63 miles. Hydrants, public, 468. PRESSURE.—Ordinary and fire, 120 lbs.; FINANCIAL.—Withheld. MANAGEMENT.—Prest., W. S. Kuhn, Pittsburg, Pa.; Secy. and Treas., A. E. Claney; Supt., L. C. Burnes. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96. REFERENCE.—Eng. News, Nov. 18, '82.

50. **SAINT LOUIS,** Saint Louis Co. (451,770.) Built in '31 by city and two individuals; city became sole owner in '35. New intake, pumping station, settling reservoirs and conduit have been put in use since '90-1 Manual. SUPPLY.—Mississippi River (mostly Missouri River water), at Chain of Rocks, pumping to settling basins, thence by gravity to old settling reservoirs at Bissell's Point, thence repumped through stand-pipes and distributing system to reservoir. CONDUIT.—About 7 miles long; masonry, with carrying cap. of 100,000,000 galls. per day. PUMPS.—Chain of Rocks, cap., 100,000,000 galls.: 2—30,000,000-gall. Allis vert. comp.; 2—20,000,000 Worthington vert. comp. high duty. Press repts. state that in Feb., '97, contract was let for 2—30,000,000 Allis, to be added to this plant. In '89, the high service, or repumping plant, included 3—15,000,000 single and an 18,000,000-gall. double comp. beam and fly-wheel pumps. Since '90 makers rept. 2—15,000,000 and 2—10,000,000 Allis vert. triple exp., furnished for use here. Contracts have also been let since '90 for a 16,000,000 single cylinder, low pressure cond. beam engine. Southern Illinois bituminous coal used; av. cost, $1.39 per short ton. SETTLING BASINS.—Old: Cap., 100,000,000; now used for storage at repumping station. New: Cap., 132,000,000 galls.; 6—22,000,000. RESERVOIR.—Cap., 65,000,000 galls.; storage, located at Grand and Lafayette Aves. STAND-PIPES.—Cap., 63,000 galls.; 2—31,500; iron, 6 × 150 ft., enclosed in brick tower. FISCAL YEAR CLOSED Apr. 30, '95. DISTRIBUTION.—Mains, 462 miles; cost extensions met by revenue. Taps, 53,354; made by city for $3 and upward. Services, lead; paid for by property owner. Meters: 3,979; owned by city or consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 4,690; private, 63. CONSUMPTION.—(Galls.) av., 55,000,000; max., 72,000,000; min., 37,000,000. PRESSURE.—Ordinary and fire, 5 to 75 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '89), $13,345,000. Bonded debt (in '90), $5,200,000. Expenses, Operating, $423,259. Revenue, $1,264,254. No deficits. MANAGEMENT.—Water Comr. and Supt., M. L. Holman. PROJECTED IMPROVEMENTS.—Filter plant. Press repts. latter part of '96 stated a 2 and a 6-ft. stand-pipe, enclosed in one masonry tower, would be built at once for high service. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Engineering News: General, Apr. 9, 16, '81; specifications for pumps, Aug. 7, '86, June 18, '96, for boilers, Feb. 22, '94. Clearing water by settlement, Dec. 28, '89; Jan. 11, Feb. 1, '90; Apr. 18, '91; Oct. 31, '95, illus.; Compton Hill storage reservoir, June 21, '90; new intake tunnel and tower, July 4, '91; Feb. 20, '92, illus.; Aug. 16, '94, illus.; new machinery, Apr. 19, '94; chimney, July 26, '94, illus.; quality of supply, Apr. 26, '94; sand filtration, May 10, '94.

51. **SEDALIA,** Pettis Co. (14,068.) Now owned by Sedalia Water & Light Co.; built in '71 by city; sold to Quigley & Co., May, '87, and to Sedalia Water Co. in Sept. of the same year. June, '93, works sold to present Co. FRANCHISE.—To run until purchase of works by city, subject to indebtedness, any time after 20 yrs. Rates not to exceed St. Louis rates of '87. Co. is not exempt from local taxes. City to pay $10,150 per yr. for 175 hydrants. No legal difficulties. SUPPLY.—Lamine River, pumping to stand-pipes and to storage reservoir. PUMPS.—Cap., 9,500,000 galls.; 2—2,500,000 Blake comp. cond. for low service and 3—1,500,000 comp. cond. Bituminous coal used; av. cost, $2 per short ton. FILTERS.—Cap., 2,000,000 galls.; Hyatt. RESERVOIR.—Cap., 1,875,000,000(?) galls: Storage, 1,800,000,000 (?); area, 90 acres. Settling, 75,000,000; area, 12 acres. STAND-PIPES.—Cap., 364,000 galls.; two, of steel, each 15 × 127 ft., cap., 167,000 galls. FISCAL YEAR CLOSED Feb. 1, '97. DISTRIBUTION.—Mains, 34 miles; cost extensions met by revenue. Taps, 1,410; made by Co. at $5 for 1-in.; $4 for ¾-in; $2.75 for ½-in. Services, lead; paid for by consumer. Meters: 525; owned by Co. and consumer; controlled by Co.; repairs paid by owner of meter: yearly rental, $3 and up. Use of meters compulsory for R. Rs., factories, etc. Hydrants, public, 175. CONSUMPTION.—(Galls.) av., 1,500,000; max., 2,000,000; min., 1,000,000. PRESSURE.—Ordinary and fire, 56 lbs. Steam fire engines are held in reserve but seldom used. FINANCIAL.—Cost, $578,000. Cap. Stock: authorized, $500,000. Debt, $510,000: Floating, $10,000 at

7%. Bonded, $500,000 at 6%; due, $260,000 in 1923; balance held in escrow for extensions. Sinking Fund will be begun next year. Expenses, $24,000: Operating, $7,000; int., $15,600; taxes, $1,400. Revenue, $36,700. The revenue pays one-half cost of extensions, escrow bonds the balance. MANAGEMENT.—Supt., M. L. Andrews; Ch. Pump. Engr., Jno. Walker. Rept. by Prest., J. B. Quigley, Jan. 27, '97, and by Secy., L. P. Andrews, Dec. 20, '96. SEWERS.—About 15 miles combined sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 4, '82.

P 9. **SLATER,** Saline Co. (2,400.) City proposed to build works for general supply between Nov., '96, and Mar., '97. Supply, artesian wells, pumping to reservoir. Est. cost, $20,000. Rept. by Mayor, R. L. Harvey, Aug. 28, '96.

52. **SPRINGFIELD,** Greene Co. (21,850.) Built in '83 by Springfield Water Co. FRANCHISE.—20 yrs. from '82; provides for purchase of works by city in '93 and every 5 yrs. thereafter. Rates are regulated by charter (franchise?). Co. is not exempt from local taxes. City to pay $50 to $60 per hydrant per yr. No legal difficulties. SUPPLY.—Large spring, 3½ miles N. E. of city, and Big Sac River, 5 miles N. E. of city, pumping to distributing reservoir and tank. PUMPS.—Cap., 10,500,000 galls.: 4,500,000 comp., 3,000,000 (makers rept. 5,000,000) trip. exp. and 1,000,000 Deane; 2—1,000,000 Blake. Bituminous coal used; av. cost, $3 per short ton, delivered. RESERVOIRS.—Cap., 4,000,000 galls.; storage, 500,000, at spring; distributing, 3,500,000, in city. TANK.—Cap., 65,000 galls.; 24 × 20 ft., on brick tower 113 ft. above city. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 57½ miles; cost extensions met by income. Taps, 2,250; made by Co.; tap, $4; corporation cock, $1.50; stop cock and box, $3.50. Services, galv. i.; paid for by property owner. Meters, 105; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with consumer by paying $20 for ⅝ to ¾-in. and upward; compulsory for factories and public places. Hydrants, public, 229; private, 17. CONSUMPTION.—(Galls.) av., 1,600,000; max., 2,000,000; min., 1,500,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $475,000. Cap. Stock: Authorized, $500,000; all paid-up. Revenue, $16,155: Consumers, unmetered, $2,145; metered, $105; City, fire protection and public buildings, $12,105; street sprinkling, $1,800. MANAGEMENT.—Prest., Geo. P. Wescott; Secy. and Treas., Geo. F. West; both of Portland, Me.; Ch. Pump. Engr., W. D. Mayber. Rept. by Mgr., W. C. Hornbeak, June 22, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Sept. 5, '85.

53. **STANBERRY,** Gentry Co. (2,035.) Built in '92-3 by city. PUMP.—Cap., 500,000 galls.; Deane comp. dup. (rept. by makers). DISTRIBUTION.—Mains, about 3½ miles.

54. **TARKIO,** Atchison Co. (1,156.) Built in '91 by Tarkio Electric Light & Water Co.; put in operation Jan. 1, '92. FRANCHISE.—20 yrs. from '92. SUPPLY.—Artesian well, in bottom of small collecting reservoir, pumping to stand-pipe and direct. PUMP.—Cap., 500,000 galls.; Deane comp. dup. Av. cost of coal used, $2.50 per short ton. STAND-PIPE.—Cap., 42,000 galls.; iron; 12 × 50 ft. DISTRIBUTION.—Taps, 125; made for $10. Services, lead; paid for by consumer. Meters, 5; owned and repaired by consumer; controlled by Co. Use of meters not optional with Co. Hydrants, public, 15; private, 2. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. MANAGEMENT.—Prest. and Treas., D. Rankin. Rept. by Secy. and Supt., W. F. Marshall, Sept. 8, '96.

55. **TRENTON,** Grundy Co. (5,039.) Built in '86 by Trenton Water Co. FRANCHISE.—30 yrs. City to pay $2,500 per yr. for public service. SUPPLY.—Grand River and well close by, pumping to stand-pipe and direct. PUMPS.—Cap., 200,000 galls.; Smith-Valle. FILTER.—Cap., 400,000 galls.; Hyatt (New York). STAND-PIPE.—Cap., 317,000 galls.; 20 × 135 ft. DISTRIBUTION.—Mains, 7 miles. Taps, 350. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 130 lbs. FINANCIAL.—(In '90.) Cost, $78,200. Cap. Stock: Authorized, $75,000; paid-up, $55,000; paid no div'd in '90. Debt, $81,750: Floating, $1,750, at 6%. Bonded, $80,000, at 6%; due in 1908. Expenses: Operating, $3,000. MANAGEMENT.—Rept. by Co. in '96.

56. **UNION,** Franklin Co. (610.) Built in '96 by city; put in operation Nov. 1. Engr., Wm. H. Bryan, St. Louis. Contrs., Busch, Gorg & Kassmann. SUPPLY.—Bombois River, pumping to reservoir and direct. PUMP.—Cap., 500,000 galls.; Hooker dup. Wood used; av. cost, $2 per cord. RESERVOIR.—Cap., 175,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by city revenues. Services paid for by consumer. Meters owned by city or consumer; controlled by city; repairs paid by owner. City can compel use of meters and any consumer may have one. Hydrants, public, 19. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $10,000. Bonded debt, $6,000, at 5%; due in 5 to 20 yrs. Expenses are all paid out of general city revenue. Rept. by Engr., Nov. 18, '96. SEWERS.—None.

P 10. **UNIONVILLE,** Putnam Co. (1,118.) City proposes to build works in '97. Engr., Stephen Hall, Kirksville. Supply, deep well, pumping to stand-pipe. Est. cost, $15,000. Rept. by Mayor, Lorenzo Jones, Nov., '96.

57. **VERONA,** Lawrence Co. (Est., 500.) Built in '94 by Co. SUPPLY.—River, pumping to stand-pipe. FINANCIAL.—Cost, $30,000. MANAGEMENT.—Engr., J. T. Hubbard. Rept. by citizen, July 27, '96.

58. **WARRENSBURG,** Johnson Co. (4,706.) Built in '94 by J. H. Christopher. Press rept., Feb., '94, stated Warrensburg & Pertle Springs Water Co. had been incorp. by J. H. Christopher and others. FRANCHISE.—20 yrs. from '94. City to pay $3,000 per yr. for public service. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 2,450,000 galls.; two Deane comp. dup. (rept. by makers). DISTRIBUTION.—Hydrants, public, 64. CONSUMPTION.—(Galls.) av., 8,000. FINANCIAL.—Cap. Stock: Authorized (press rept.), $150,000. MANAGEMENT.—Rept. by Mayor, C. E. Clark, Jan. 21, '97. SEWERS.—Has "poor" sanitary and storm sewers.

59. **WASHINGTON,** Franklin Co. (2,725.) Built in '88-9 by Washington Water & Light Co. In '89 local co. was controlled by Interstate Gas & Water-Works Co., St. Louis. FRANCHISE.—20 yrs. from '89; provides for purchase of works by city at end of 20 yrs. No legal difficulties. SUPPLY.—Missouri River, pumping to filter and clear water reservoir, thence repumping to stand-pipe and direct. PUMP.—Cap., 1,000,000 galls.; Buffalo. Bituminous pea coal used; av. cost, $1.75 per short ton, delivered. FILTER.—Cap., 200,000 galls.; Hyatt (New York). RESERVOIRS.—Cap., 125,000 galls.; 75,000; 50,000 clear water basin. STAND-PIPE.—Cap., 105,000 galls.; steel; 12 x 125 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 4½ miles. Taps, 128; made by Co., free. Services, iron; paid for by consumer. Meters, 70; owned and repairs paid by consumer; controlled by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 50; private, 1. CONSUMPTION.—(Galls.) av., 75,000; max., 160,000; min., 50,000. PRESSURE.—Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $65,000. Cap. Stock: Authorized, $80,000; all paid-up. Bonded debt, $50,000, at 6%. Expenses, $5,200: Operating, $1,850; int., $3,000; taxes, $350. Revenue, $5,780: Consumers, unmetered, $1,020; metered, $1,500; City, fire protection, $3,000; street sprinkling, $60; other purposes, $200. MANAGEMENT.—Prest., L. Wattenberg; Ch. Pump. Engr., Jos. Inter. Rept. by Secy. and Supt., H. D. Hibbeler, June 3, '96. SEWERS.—Has sanitary and storm sewers.

60. **WEBB CITY AND CARTERVILLE,** Jasper Co. (Webb City, 5,043; Carterville, 2,884.) Built in '90 by Co.; now operated by Webb City & Carterville Water-Works Co. FRANCHISE.—20 yrs. from '89, with option of purchase of works by city after 15 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $50 each per yr. for 149 fire hydrants. Contract with city for 20 yrs. from May 20, '90, with privilege of renewal if city does not buy works and franchise. LEGAL DIFFICULTIES.—Co. sued city Nov., '94, for non-payment of rental; judgment for Co.; city has appealed to Supreme Court. SUPPLY.—Springs, by gravity to supply well, thence pumping to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Hughes comp. dup. Run of mine bituminous coal used; av. cost, $1.87½ per short ton, delivered. STAND-PIPE.—Cap., 125,000 galls.; steel; 12 x 145 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 21 miles; cost extensions in '92 met by sale of $37,000 second mortgage bonds. Taps, 908; made by licensed plumber under bond, Co. charging $2.50 each, $1 of which is for plumber. Services, galv. i.; paid for by consumer. Meters, 151; owned by consumer; controlled by Co.; repairs made by Co. at consumer's expense. Use of meters compulsory for all stores. Co. can compel use of meters and any consumer may have one. Hydrants, public, 149; private, 4. CONSUMPTION.—(Galls.) av., 500,000; max., 700,000; min., 300,000. PRESSURE.—Ordinary, 45 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $120,000. Cap. Stock: Authorized, $120,000; all paid-up. Net earnings, $8,000. Debt, $122,000: Floating, $10,000, at 8%. Bonded, $75,000, at 6%, due in 1910; $37,000, at 6%, due in 1907. Expenses, $17,371: Operating, $9,000; int., $7,821; taxes, $550. Revenue, $24,822: Consumers, unmetered, $5,372; metered, $12,000; City, fire protection, $7,450. MANAGEMENT.—Prest. and Treas., Jas. O'Neill; Vice-Prest., Henry O'Neill; Ch. Pump. Engr., E. F. Greeley. Rept. by Secy. and Supt., Geo. H. Bruen, June 4, '96. SEWERS.—Has storm sewers only.

D 1. **WEBSTER GROVES,** Saint Louis Co. (1,783.) In '91 Webster Groves Water Co. laid about 1,500 ft. of pipe to supply ten stockholders with water. Well, pumping to tank. No revenue. No rept. since '90-1 Manual.

61. **WESTPORT,** Jackson Co. (Est., 950.) Built in '89-90 by city. Mains owned by Kansas City. Westport was incorporated into Kansas City, but afterwards separated by a decision of the Supreme Court of Missouri. Westport is now negotiating $75,000 in bonds to be used to extend mains and furnish needed water supply in anticipation of annexation to Kansas City. Rept. by A. B. Abercrombie, Cy. Engr. Press rept., Feb., '97, stated that contract for mains had been awarded to Adam J. Armstrong, at $50,900.

62. **WILLOW SPRINGS,** Howell Co. (1,535.) Built by city; leased for 15 yrs. from Apr. 1, '98, to Wm. Krielow, who "sold" to H. B. Cunningham. Mr. Krielow repts. he was informed that the plant has been again sold, incorporated and stock issued, but can find no record of the same. No legal difficulties. SUPPLY.—Deep well, pumping to tank. PUMP.—Cap., 40,000 galls.; Smith-Valle. Wood used; av. cost, $1.25 per cord. TANK.—Cap., 67,000 galls.; wood; 24 x 20 ft., on wood trestle 34 ft. high. DISTRIBUTION.—Mains, 3 miles. Taps, 75; made by lessee. Services, galv. i.; paid for by consumer. Meters, 10; owned, controlled and repaired by Co. Use of meters compulsory for mills, livery stables and hotels. Lessee can compel use of meters and any consumer may have one. Hydrants, public, 7. PRESSURE.—Ordinary and fire, 20 to 40 lbs. FINANCIAL.—Cost, $16,000. Expenses: Operating, $1,200. Revenue, $2,000. Rept. by W. Krielow, Jan. 15, '97. SEWERS.—Has sanitary sewers.

ARKANSAS.

D 1. **ALEXANDER,** Pulaski Co. (146.) Built in '88 by Alexander Water Co. Springs by gravity to tank. Mains, 1,400 ft. Taps, 10. Hydrants, 0. Water used chiefly by stockholders. Cost, $400. No debt. No rept. since '90-1 Manual.

1. **ARKADELPHIA,** Clark Co. (2,455.) Built in '90-1 by Arkadelphia Water & Light Co; put in operation Sept. 1. Sold under mortgage foreclosure in '96 to trustees for bondholders; new Co. is being organized. Press repts. state Arkadelphia Water & Electric Light Co. was incorp. in Feb., '97, with authorized cap. stock of $50,000. FRANCHISE.—30 yrs. SUPPLY.—River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; comp. dup. STAND-PIPE.—Cap., 235,000 galls.; iron. DISTRIBUTION.—Mains, 7.5 miles. Services, galv. i. PRESSURE.—(In '90.) Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cost, $70,000. Cap. Stock: authorized, $100,000; paid-up, $60,000. Bonded debt, $60,000 at 6%. Revenue, City, $2,000. MANAGEMENT.—Rept. by C. V. Murray. Press rept. gives officers of new Co. (see above) as: Prest., C. V. Murray; Secy., E. W. McKorkle.

2. **ARKANSAS CITY,** Desha Co. (Est., 821.) Built in '89 by Arkansas City Water Co. SUPPLY.—Mississippi River, pumping to tank. PUMP.—Cap., 560,000 galls.; Hughes. TANK.—Cap., 70,000 galls. DISTRIBUTION.—Mains, 1¾ miles. Taps, 150. Hydrants, 10. FINANCIAL.—Cost, $3,000. Cap. Stock: Common, authorized, $10,000; paid-up, $4,000. Expenses, $600. Revenue, $1,000. NOTE.—No rept. since '90-1 Manual.

P 1. **BENTONVILLE,** Benton Co. (1,677.) Bids for complete works were to be received by city under name Bentonville Water-Works Improvement District, until Mar. 20, '94. Est. cost, $30,000. Chn., Jas. M. Bohart; Secy., J. D. Covey.

3. **BRINKLEY,** Monroe Co. (1,510.) Built in '86-7 by Brinkley Car Wks. & Mfg. Co. SUPPLY.—Well, pumping to tank. DISTRIBUTION.—Mains, 3,000 ft. NOTE.—Inquiry returned with statement: "Same as before reported."

4. **CAMDEN,** Ouachita Co. (2,571.) Built in '89 by Camden Water-Works Co.; now Camden Water, Light & Power Co. Press rept. states works of original Co. were sold under foreclosure, July, '95. SUPPLY.—Ouachita River, pumping to stand-pipe. PUMPS.—(In '89.) Cap., 1,500,000 galls.; 750,000 Gordon. STAND-PIPE.—Cap., 99,000 galls.; 15 × 75 ft. DISTRIBUTION.—Mains, 2.3 miles. Taps, 125. Meters, 0. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 175,000. FINANCIAL.—Cost, $17,500. Cap. Stock: authorized, $30,000; paid-up, $16,000. Revenue, $3,750: Consumers, $3,000; City, fire protection, $750. MANAGEMENT.—Rept. by Mgr., Howell Atwater, Aug. 10, '96. NOTE.—The above information is the same as given in '90-1 Manual. Inquiry returned stating: "Co. is not at this time prepared to give any statement in regard to its affairs in a mechanical way. Works have been burned down, with no insurance. Co. has been in litigation and in receiver's hands, sold by order of U. S. Court and is now reorganized. No changes in mechanical condition."

5. **DARDANELLE,** Yell Co. (1,456.) Built in '85 by W. E. De Long. FRANCHISE.—Provides for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $600 per yr. for public service. No legal difficulties. SUPPLY.—Mt. Nebo and river, pumping to stand-pipe. PUMPS.—Cap., 360,000 galls.; Smith-Valle. Av. cost of coal used, $4 per short ton. TANK.—Cap., 48,000 galls.; iron, on elevation of 300 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 100; made by Co. Services paid for by consumer. Hydrants, public, 12. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $10,000, at 6%. Expenses, $1,000: Operating, $900; taxes, $100. Revenue, $2,200; City, fire protection, $600; street sprinkling, $600; other purposes, $1,000. Rept. by W. E. De Long, May, '96.

6. **EUREKA SPRINGS,** Carroll Co. (3,706.) Built in '94 by city; put in operation in Dec. Contr., R. E. Brownell, Chicago, Ill. SUPPLY.—Springs, flowing into collecting reservoir, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; Worthington comp. non-cond. Wood used; av. cost, $2.50 per cord. FILTER.—Gravel. RESERVOIR.—Cap., 10,000,000. STAND-PIPE.—Cap., 84,000 galls.; steel, 12 × 100 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by revenue. Taps, 270; made by city for $2. Services, lead; paid for by consumer. Meters: 8; owned and repairs paid by consumer; controlled by city; yearly rental, none. Use of meters optional with consumer; compulsory for hotels and large lawns. Hydrants, public, 42. CONSUMPTION.—(Galls.) av., 84,600. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Revenue, Consumers, $2,600. Rept by Supt., F. M. Campbell, June 11, '96. SEWERS.—Has sanitary sewers only.

7. **FAYETTEVILLE,** Washington Co. (2,942.) Built in '95 by Fayetteville Water Co.: all stock held by W. B. & C. A. Rees. Engr., W. B. Rees. Contrs., Rees Bros. FRANCHISE.—20 yrs. from '95, or until works are purchased by city; provides for purchase of works by city any time after 20 yrs. Co. is exempt from local taxes for 6 yrs. City to pay $2,150 per yr. for public service. No legal difficulties. SUPPLY.—White River, two miles distant, pumping to reservoir and direct. PUMPS.—Cap.,1,000,000 galls.; 500,000 Dean comp. dup. and 500,000 Worthington comp. non-cond. Bituminous slack used; av. cost, $2.15 per short ton; wood is also used, at $1.50 per cord. RESERVOIR.—Cap., 1,000,000 galls. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains,

8 miles; cost extensions met by income. Taps, 260; made by Co. Services, lead or galv. t.; paid for by consumer. Meters: 10; owned partly by consumer and partly by Co.; controlled by Co.; repairs paid by owner of meter. Co. can compel use of meters and any consumer may have one; compulsory for mills and factories. Hydrants, public, 46; private, 10. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 68 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $48,000. Cap. Stock: authorized, $50,000; paid-up, $22,500. Bonded debt, $25,500 at 8%; due in 20 yrs. from '95. No sinking fund; will be begun after 6 yrs. Expenses, $4,143: Operating, $1,695; int., $2,080; taxes, $368. Revenue, $5,505; City, fire protection, $2,150; other purposes, $3,355. Revenue pays running expenses and all extensions. MANAGEMENT.—Secy., Chas. Fratt; Treas. and Supt., C. A. Rees. Rept. by Prest., W. B. Rees, Jan. 9, '97. SEWERS.—No sewers.

8. **FORREST CITY,** Saint Francis Co. (1,021.) Under construction in '96 by city. Contr., S. P. McDaniel, Forrest City. SUPPLY.—Driven well, pumping to tank. FINANCIAL.—Cost, $7,500. MANAGEMENT.—Address J. E. Stone or L. P. Smith. Rept. by Treas., Jas. Frissell, July 29, '96.

9. **FORT SMITH,** Sebastian Co. (11,311.) Built in '84 by Fort Smith Water Co.: now known as Municipal Water-Works Co. FRANCHISE.—20 yrs. from '91. Certain rates are fixed in franchise. Co. is exempt from local taxes. City to pay $60 per hydrant per yr. SUPPLY.—Poteau River, pumping to tank and direct; filtered. PUMPS.—Cap., 5,500,000 galls; 2,000,000 Blake, comp. cond. and 3,500,000 Worthington comp. cond. Pumping station is being rebuilt. Bituminous slack used; av. cost, $1 per short ton. RESERVOIR.—Cap., 12,000,000 galls.; settling and storage (under construction). TANK.—Cap., 528,000 galls.; steel, 30 × 100 ft. DISTRIBUTION.—Taps, 18,000; made by Co. at $3 for ½-in; $3.25 for ⅝-in. and $3.50 for ¾-in. Meters: 75; owned, controlled and repaired by Co. Use of meters optional with consumer. Meters are used on all services not mentioned in franchise rates. Hydrants, public, 135. PRESSURE.—Ordinary, 45 lbs.; fire, 120 lbs. MANAGEMENT.—Prest., Geo. M. Myers; Secy. and Treas., L. K. Taylor, both of Kansas City, Mo.; Ch. Pump. Eng., J. B. Fulton. Rept. by Supt., S. J. Rosamond, Nov. 1, '96. SEWERS.—Has sanitary and storm sewers. NOTE.—The note published in '90-1 Manual regarding proposed application for receiver should have appeared under Pine Bluff. REFERENCE.—Eng. News, Mar. 20, '86.

10. **HELENA,** Phillips Co. (5,189.) Built in '92 by Helena Water Co.; put in operation Sept. 17. Engr., E. N. Maxwell, Texarkana. FRANCHISE.—30 yrs. from '92 with option of purchase of works by city every 5 yrs. Rates are fixed in franchise. No legal difficulties. SUPPLY.—Artesian wells, flowing to pumps, thence pumping to reservoir and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington, high duty. Arkansas nut bituminous coal used; av. cost, $2.25 per short ton. RESERVOIR.—Cap., 1,500,000 galls. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by revenue. Taps, 400; made by Co. for $4.75 including corp. cock and lead goose neck. Services, galv. i.; paid for by consumer. Meters: 48; owned by Co. and consumers; controlled and repaired by Co; yearly rental, $3. Use of meters compulsory for manufactories, stables, hotels and all steam users. Co. can compel use of meters and any consumer may have one. Hydrants, public, 85; private, 5. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 55 lbs.; fire, direct pressure. FINANCIAL.—Cost, $63,400. Bonded debt, $60,000 at 6%. Expenses, $6,930: Operating, $3,100; int., $3,600; taxes, $230. Revenue, $6,990: Consumers, unmetered, $4,600; metered, $1,700; street sprinkling, $340; public buildings, $200; other purposes, $150. MANAGEMENT.—Prest., R. M. Foster, St. Louis, Mo.; Ch. Pump. Engr., J. P. Horton. Rept. by Secy., Treas. and Supt., S. A. Stearns, July 25, '96. PROJECTED IMPROVEMENTS.—Lowering pumps, in spring of '97. SEWERS.—None.

11. **HOPE,** Hempstead Co. (1,937.) Built in '85 by town. SUPPLY.—Deep wells, pumping to tank. PUMP.—Cap., 200,000 galls.; Knowles. Wood used. TANK.—Cap., 56,000 galls.; 20 × 24 ft., on wood tower 70 ft. high. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by consumers. Taps, 350; made by consumer, no fee. Services, iron; paid for by consumer. Meters, 4; owned, controlled and repaired by town. Use of meters compulsory for livery stables, etc. Town can compel use of meters and any consumer may have one. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—No debt. Expenses: Operating, $2,000; taxes, $15. Deficits are met by taxes. MANAGEMENT.—Ch. Pump. Engr., S. M. Wornock. Rept. by Jno. T. Barr, July, '96. SEWERS.—Has storm sewers only.

12. **HOT SPRINGS,** Garland Co. (8,086.) Built in '82 by Hot Springs Water Co. FRANCHISE.—Exclusive; 50 yrs. LEGAL DIFFICULTIES.—In '92, lower court upheld that original contract with assignor to Co. was valid and that city must pay back hydrant rental; also that a contract between city and Co., made in Mar., '85, was void. SUPPLY.—Bull Bayou and springs, pumping to distributing reservoir. PUMPS.—(In '89.) Cap., 2,000,000 galls.: 1,000,000 Worthington comp. non-cond., at springs; Knowles comp. cond. dup. RESERVOIR.—Cap., 1,000,000 galls.; 262 ft. above city. DISTRIBUTION.—Mains, 12 miles. Hydrants, public, 85. FINANCIAL.—Withheld. MANAGEMENT.—Prest. Jno. Martin; Secy. and Treas., W. R. Lehmicke. Rept. by Gen. Mgr., H. H. Harrison, Nov. 12, '96. REFERENCE.—Eng. News, Nov. 4, '82.

P 2. **JONESBORO,** Craighead Co. (2,065.) Bryan & Humphrey, St. Louis, rept. in Dec., '96, that they had done some preliminary engineering for works here.

13. **LITTLE ROCK,** Pulaski Co. (25,874.) Built in '78 by Little Rock Water Co.; afterward sold to Home Water Co., which is controlled by American Water-Works & Guarantee Co., Pittsburg, Pa. In '87-8 Arkansas Water Co. put in pump and reservoir to supplement old supply. FRANCHISE.—50 yrs; provides for purchase of works by city 1905; price to be determined by arbitration. Rates are fixed in franchise. SUPPLY.—Arkansas River, pumping to settling and distributing reservoir and stand-pipe. PUMPS.—Cap., 11,000,000 galls.: 5,000,000 Worthington comp. high duty; 5,000,000 and 1,000,000 Blake. FILTERS.—Cap., 5,000,000 galls.: 10 American, 4 National, 4 Jewell. Makers rept. 4,000,000 New York (American and National). RESERVOIR.—Cap., 11,000,000 galls.; in two compartments. STAND-PIPE.—Cap., 352,000 galls.; iron; 20 × 150 ft., on ground 65 ft. above reservoir. DISTRIBUTION.—Mains, 46 miles. Hydrants, public, 321; private, 12. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., J. H. Purdy, Pittsburg, Pa; Secy. and Treas., J. F. Cockburn. Supt., F. C. Amsbary. Rept. by Am. W.-W. & Guar. Co., Pittsburg, Pa., Aug. 20, '96. REFERENCE.—Eng. News, Feb. 3, '83.

14. **LONOKE,** Lonoke Co. (858.) SUPPLY.—Well, 4 in. × 100 ft. TANK.—Cap., 15,000 galls. DISTRIBUTION.—Taps, 300. Hydrants, public, 100. Rept. by Pump. Engr., W. M. Daniel.

P 3. **MONTICELLO,** Drew Co. (1,285.) Press rept., Nov., '96, stated city had awarded contract for water and electric light plants to Electric Engineering & Supply Co., Memphis, Tenn.

15. **NEWPORT,** Jackson Co. (1,571.) Built in '86-7 by Newport Irrigation & Water Co. SUPPLY.—White River, pumping to tank. PUMPS.—Cap., 1,500,000 galls.; two Smith-Vaile dup. TANK.—On brick tower 100 ft. high; built in '96. DISTRIBUTION.—Mains, 5.5 miles. Hydrants, public, 62. FINANCIAL.—(In '90.) Cost (in '88), $52,000. Bonded debt, $40,000, at 7%. MANAGEMENT.—Prest., L. Hirsch; Secy., Treas. and Gen. Mgr., L. Miner. Rept. by Supt., W. M. Knowles. REFERENCES.—Stand-pipe failure, Eng. News, Oct. 6, '88, Apr. 19, '94; stand-pipe, May 2, '95.

16. **PINE BLUFF,** Jefferson Co. (9,952.) Owned by Preston & Bright. In receiver's hands until Apr. 1, '96. Formerly owned by Pine Bluff Water & Light Co. Built in '88 by Water, Light & Power Co. Reorganization not yet made, but proposed. Feb. 27, '97, Pine Bluff Light & Water Co. was incorp. in W. Va., with authorized cap. stock of $250,000, by Chas. H. Triplett, Pine Bluff; M. H. Johnson, Little Rock; C. H. Ledlie, St. Louis, and others. FRANCHISE.—30 yrs. from '89; provides for purchase of works by city after 15 yrs. and every 5 yrs. thereafter. Rates are not fixed in franchise nor subject to regulation by city, but are based on those of St. Louis. Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Numerous troubles with city on account of pressure, as no pressure is stipulated in contract. Settled by compromise. SUPPLY.—Driven wells, and Arkansas River for fire service, pumping to stand-pipe. PUMPS.—Cap., 4,000,000 galls.: 2—2,000,000 Gordon comp. dup. Bituminous lump coal and slack used; av. cost, $2.60 per short ton. STAND-PIPE.—Cap., 88,000 galls.; 10 × 150 ft. DISTRIBUTION.—Mains, 14 miles. Taps, 530; made by Co. at $13 for ¾-in. and $15 for 1-in., including service to curb and stop box. Services, galv. i.; paid for by consumer. Meters, 11; owned, controlled and repaired by Co. Use of meters optional with consumer. City refuses to pass ordinance authorizing Co. to put in meters. Hydrants, public, 195; private, 15. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,500,000; min., 900,000. PRESSURE.—Ordinary, 20 to 50 lbs.; fire, 60 lbs. MANAGEMENT.—Mgr., C. H. Ledlie, St. Louis, Mo. Rept. by Supt., W. A. Lee, Sept. 18, '96. SEWERS.—Has sanitary sewers only.

17. **ROGERS,** Benton Co. (1,265.) Built in '88 by Rogers Lime & Water Co. SUPPLY.—Spring, pumping to tank. PUMP.—Cap., 720,000 galls.; Hughes dup. TANK.—Cap., 45,000 galls.; 22 × 16 ft., on brick tower. DISTRIBUTION.—Mains, 10 miles. Taps, 300. Hydrants, public, 92. CONSUMPTION.—(Galls.) av., 70,000. FINANCIAL.—Cost, $25,000. No debt. Expenses, $1,450: Operating, $1,200; taxes, $250. Revenue, $4,635. MANAGEMENT.—Rept. by Mgr., W. R. Feilter, Sept. 19, '96.

18. **TEXARKANA,** Miller Co. (Total, 6,380: in Ark., 3,528; in Tex., 2,852.) Reorganized in '95 as The Water Co. of Texarkana; built in '87 by Texarkana Water Co.; consolidated in '91 with Texarkana (Tex.) Water Co. FRANCHISE.—30 yrs. Co. is not exempt from local taxes. SUPPLY.—Driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 5,000,000 galls.: 2—2,500,000 Gordon-Maxwell. Wood used; av. cost, $2 per cord. RESERVOIR.—Cap., 5,000,000 galls.; impounding (lake), for fire protection. STAND-PIPE.—Cap., 258,000 galls.; 20 × 110 ft. DISTRIBUTION.—Mains, 9¼ miles; cost extensions met by income. Taps, 550; made by Co. at consumer's expense. Services, galv. i. and lead, paid for by consumer. Meters, 270; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 67; private, 20. CONSUMPTION.—(Galls.) av., 950,000; max., 1,000,000; min., 900,000. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $100,000; all paid-up. Bonded debt, $250,000, at 6%; due 1910. Expenses, $20,850: Operating, $5,100; int., $15,000; taxes, $750. Revenue, $22,560: Consu-

mers, $7,560; City, fire protection, $5,900; other purposes, $10,000. MANAGEMENT.—Prest., Wm. M. Paul, Moorestown, N. J.; Secy., J. E. Ramsey, Oxford, Pa.; Treas., T. B. Sweet, Topeka, Kan. Rept. by Supt., R. A. Munson, Sept. 19, '96.

19. **VAN BUREN**, Crawford Co. (2,291.) Built in '92-3 by Van Buren Water Co.; completed in June. Engr., E. K. Blanchard, Nevada, Mo. SUPPLY.—Lee's Creek, pumping to reservoir. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 comp. dup. RESERVOIR.—Cap., 2,000,000 galls.; surface 260 ft. above pumps. DISTRIBUTION.—Hydrants, 36. PRESSURE.—About 100 lbs. FINANCIAL.—Cost, about $50,000. MANAGEMENT.—(In '93.) Prest., Thos. Connor, Joplin; Secy. and Treas., Robt. S. Hynes; Supt., W. S. Jones. Information from apparently accurate description in Van Buren "Argus," June 14, '93.

20. **WARREN**, Bradley Co. (492.) Built in '96-7 by city; about completed Mar. 9. Rept. by Mayor, A. C. Jones.

TEXAS.

1. **ABILENE**, Taylor Co. (3,194.) Bought by town in '89; built in '85-6 by Co. Press repts. state city leased works to Abilene Water-Works Co., Apr. 1, '92, but annulled lease and took possession of works again in '93, Co. failing to pay int. on city's water bonds, as agreed. SUPPLY.—Wells and Lytle Creek, pumping to stand-pipe and direct. PUMPS.—Cap., 720,000 galls.; 2—360,000 Blake dup. STAND-PIPE.—Cap., 70,000 galls.; 12 × 85 ft. DISTRIBUTION.—Mains, 4 miles. Taps, 85. Meters, 0. Hydrants, 35. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $42,500. Debt, $32,500 at 8%. Expenses: Operating, $2,400. NOTE.—No rept. since '89-90 Manual.

D 1. **ALTA LOMA**, Galveston Co. (Not given.) Leased by Henry Miller for 5 yrs. from June 1, '96; built in '96 by J. W. Byrnes, Galveston. Supply, flowing artesian wells, cap., 400,000 galls., by gravity direct. It is proposed to put in windmill pump and 30,000-gall. cypress tank, elevated 60 ft. Mains, 1½ miles. Taps, 25; made by consumer at $1 for ¾-in.; $1.50 for 1-in.; $2.00 for 1½-in. Services, iron; paid for by consumer. Rept. by Lessee, June 24, '96. No sewers.

P 1. **ALVARADO**, Johnson Co. (1,543.) The Alvarado Water Supply & Light Co. has been incorp. and proposes to build works if supply can be secured. Supply, artesian well, pumping to stand-pipe. Well is down 1,800 ft. and is to be sunk 200 ft. more. Est. cost, $25,000. Latest rept. from M. Samson (of the Co.), Dec. 18, '97.

F 1. **ARLINGTON**, Tarrant Co. (664.) Jan., '97, citizen rept. that there were a few hydrants on pipe extending from an artesian well. The Arlington Water-Works Co. was rept. in '93 as about to be incorp.

2. **ARLINGTON HEIGHTS** (P. O. Fort Worth), Tarrant Co. (Not given.) Built in '90 by Chamberlain Investment Co. See note. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Cap., 260,000 galls.; one 80,000 and 180,000 Cook. TANK.—Cap., 105,000 galls.; 30 × 20 ft. DISTRIBUTION.—(In '90.) Mains, 3.2 miles. Hydrants, 40. FINANCIAL.—(In '90.) Cost, $60,000. NOTE.—Above from '90-1 Manual. July 9, '96, Jno. T. Montgomery, Cy. Secy. of Ft. Worth, rept.: "Arlington Heights went into hands of Robt. McCart, an attorney of our city, about one year ago." Unsigned rept., Sept., '96, stated "they have water-works."

3, 4. **AUSTIN**, Travis Co. (14,575.)

AUSTIN WATER, LIGHT & POWER CO.

Owned by Austin Water, Light & Power Co.; built in '75 by City Water Co. FRANCHISE.—20 yrs. from '82 and 20 yrs. more if city does not purchase; provides for purchase of works after 10 yrs., price to be determined by appraisers, and not to include value of franchise. Rates not to exceed 50 cents per 1,000 galls. Co. is exempt from local taxes in consideration of the water furnished free to city. City to pay $100 each for 100 hydrants, $50 for each extra one, at rate of 10 hydrants to the mile; furnished and set by the Co. City has the right to furnish and set 25 hydrants at its own expense to which the Co. furnishes water free. City can connect stand-pipes to extensions without charge and may allow property owners to do the same. Water free for sewer flushing, city buildings, 15 public watering troughs, one fountain in each park and public ground with jets not over 1-16-in. to run not over 6 hrs. per day and 8 mos. during the yr., and city cemetery. LEGAL DIFFICULTIES.—Co. failed in its attempts to prevent building of works by city. Press repts. stated that U. S. Court compelled city to pay for water actually used for public purposes before city works were put in operation; that in '95, city did not take water from Co., and U. S. Court held that Co. could not collect sums stipulated in franchise, exclusive franchises being invalid in Texas; also that Co. would appeal to U. S. Court at New Orleans. SUPPLY.—Wells, one 50 ft. in diam., one 30 ft. and one 25 ft.; also driven wells in trenches connecting three large wells, pumping direct. PUMPS.—Cap., 8,000,000 galls.: 3,000,000 Holly quadruplex; 5,000,000 Holly-Gaskill hor. high duty. DISTRIBUTION.—Hydrants, public, 167. CONSUMPTION.—(Galls.) av., 4,000,000.

PRESSURE.—Ordinary, 100 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Revenue: City, $12,050. MANAGEMENT.—Prest., Jos. Nolla; Secy., D. L. Wickes; Supt., R. H. Felter; Ch. Pump. Engr., W. W. Williams. REFERENCE.—Eng. News, Apr. 19, '84.

MUNICIPAL WORKS.

Built in '91-5 by city. SUPPLY.—Springs, pumping direct. The original plan was to pump from the Colorado River to large settling reservoirs. The reservoirs were not built, and the water proved muddy at times. It was decided to utilize springs which were discovered in building the power house. DAM.—A large granite masonry dam extends across river and furnishes power for pumping and electric lighting plant, with a great surplus available for commercial uses. The dam has a length of 1,360 ft., and is 60 ft. high. PUMPS.—Original: Cap., 8,000,000 galls.; 2—4,000,000 Stilwell-Bierce & Smith-Vaile, driven by Victor wheels. New: Cap., 3,000,000 galls.; 2—1,500,000 Goulds vert. triplex, driven by 240-HP. McCormick turbine. These were added in '96 to pump the spring water. Press rept., Mar., '97, stated the original pumps would be removed and (evidently) be used for the spring supply. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, about 25 miles. Taps, about 1,000. Hydrants, public, 223, or more. FINANCIAL.—Cost, water and light plant, $1,391,000, of which $611,313 was for dam. MANAGEMENT.—Water, Light & Power Com. Information mostly from annual rept. for '95. SEWERS.—Has sewers. REFERENCES.—Colorado River dam, July 11, '91, Nov. 10, '92, June 29, July 27, Sept. 28, Oct. 19, '93, Jan. 25, June 14, and Aug. 2, '94; rept. on dam by J. T. Fanning, Aug. 18, Sept. 29, '92; break in canal and headgates of dam, June 8, July 27; Aug. 3, '93; cableway, Jan. 26, '93; Stilwell-Bierce pumps, Apr. 19, '94, illus.

5. **BALLINGER,** Runnels Co. (Est., 1,390.) Built in '94 by city; put in operation in June. Contr., J. M. Carter, Bowie. SUPPLY.—Elm Creek, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). STAND-PIPE.—Cap., 67,000 galls.; 12 × 80 ft. DISTRIBUTION.—Mains, 4½ miles. Meters, 0. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 65,000. FINANCIAL.—Cost, $20,000. Debt, $34,500: Floating, $18,000, at 6%. Bonded, $16,500, at 6%; due in 50 yrs. from '94. Sinking Fund, $1,000, not invested. MANAGEMENT.—Rept. by Mayor, J. W. Powell, Feb. 3, '97.

6. **BASTROP,** Bastrop Co. (1,634.) Built in '94 by Bastrop Water & Light Co.; put in operation in July. Engr., W. E. De Long. FRANCHISE.—50 yrs. from '94. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $900 per yr. for hydrant rental. No legal difficulties. SUPPLY.—River and well, pumping to stand-pipe and direct. PUMP.—Cap., 50,000 galls. (?); Smith-Vaile. Wood used; av. cost, $2 per cord. STAND-PIPE.—Cap., 126,000 galls.; 14 × 110 ft. FISCAL YEAR CLOSED July, '95. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by profits. Taps, 100; made by Co. at cost. Services, w. i.; paid for by property owner. Meters, 1; owned, controlled and repaired by Co. Use of meters compulsory for factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 17; private, 1. PRESSURE.—Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock: Paid-up, $30,000; paid div'd in '95, $1,500. Floating debt, $4,000, at 10%. Expenses, $1,800: Operating, $1,200; int., $400; taxes, $200. Revenue, $6,000: Consumers, $2,000; City, fire protection, $900; street sprinkling, $400; public buildings, $300; other purposes, $2,400. MANAGEMENT.—Secy., I. A. Hasler; Treas., W. J. Hill; Supt., Joe Zuborg. Rept. by Prest., Chester Erhard, June 12, '96. SEWERS.—None.

7. **BEAUMONT,** Jefferson Co. (3,296.) Leased by Beaumont Ice, Light & Refrigerating Co. for 30 yrs. from '88; built in '88 by city. FRANCHISE.—Rates are not subject to regulation by city. SUPPLY.—Neches River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,600,000 galls.; 1,000,000 Knowles and 600,000 Smith-Vaile. Saw dust used. STAND-PIPE.—Cap., 101,000 galls.; iron; 12 × 120 ft. DISTRIBUTION.—Mains, 2 (?) miles; cost extensions met by city. Taps, 200; made by Co., free. Services, w. i.; paid for by consumer. Meters, 8; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60 (?). CONSUMPTION.—(Galls.) av., 750,000; max., 1,000,000; min., 500,000. PRESSURE.—Ordinary, 48 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $25,000. Cost of maintenance and other figures are not separated from those for ice and light. MANAGEMENT.—Prest. and Supt., J. C. Ward; Secy. and Treas., E. L. Bacon. Rept. by Co., June 4, '96. PROJECTED IMPROVEMENTS.—New pump to be put in during winter of '96-7. SEWERS.—Has sanitary and storm sewers.

D 2. **BEEVILLE,** Bee Co. (1,311.) Built in '94 by Beeville Water Co.; only domestic service furnished. Supply, three 8-in. driven wells, pumping to tank and direct. Pump., 2,000,000 gall. Laidlaw-Dunn-Gordon. Lignite used; av. cost, $2 per short ton. Tank., cap., 45,000 galls.; 22 × 16 ft. Mains, 3 miles. Services, galv. i.; paid for by property owner. Hydrants, public, 1. Consumption (galls.), av., 55,000. Pressure, ordinary, 40 lbs.; fire, 80 lbs. Cost, $12,000. Cap. Stock: Authorized, $25,000; paid-up, $12,000. Prest., J. M. Browson, Victoria; Secy., J. C. Crisp.; Treas., L. B. Randall. Rept. by Supt. and Gen. Mgr., Geo. W. Greathouse, June 11, '96. No sewers.

8. **BELTON,** Bell Co. (3,000.) Leased for 10 yrs. (from latter part of '95 or '96) by Belton Water Co.; built in '84 by town. SUPPLY.—Artesian wells, having daily flow of

1,500,000 galls., by gravity direct. DISTRIBUTION.—Mains, 8 miles. Taps, 500. Meters, 0. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 300,000. FINANCIAL.—Cost, $45,000. Bonded debt, $35,000. MANAGEMENT.—Prest., H. A. Wear; Treas., T. Fairweather. Rept. by Secy., Fred Wear, Sept. 22, '96. REFERENCE.—Eng. News, Nov. 8, '84.

9. **BIG SPRING**, Howard Co. (1,158.) Built in '95 by Co.; put in operation Sept. 1. FRANCHISE.—50 yrs. No legal difficulties. SUPPLY.—Springs, 200 ft. above town, pumping to reservoir 60 ft. above springs. PUMPS.—Rotary and direct, driven by gasoline engines and windmills. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 9 miles. Taps, 190; made by Co. for $2.50. Services, galv. i.; paid for by consumer. Hydrants, public, 6; private, 2. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 65 lbs.; fire, 75 lbs. FINANCIAL.—Cap. Stock: authorized, $30,000. No debt. Expenses, $2,600: Operating, $2,500; taxes, $100. Revenue, $5,650. City, fire protection, $650; other purposes, $5,000. MANAGEMENT.—Prest., Arya Aldeman; Secy. and Treas., C. L. Aldeman; both of McConnelsville, O.; Supt., H. H. Allison. Rept. by Gen. Mgr., E. R. Aldeman, Marietta, O., Aug. 1, '96.

10. **BONHAM**, Fannin Co. (3,361.) Built in '94 by city. SUPPLY.—Impounding reservoir (?), pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; two Deane comp. dup. (rept. by makers).

11. **BOWIE**, Montague Co. (1,486.) Built in '95 by city; put in operation Sept. 10. Engr. and Contr., J. M. Carter. SUPPLY.—Driven wells, 520 ft. deep and two surface wells, pumping to stand-pipe and direct. PUMPS.—A 200,000-gall. deep-well and a 750,000-gall. Gordon. Wood used as fuel. STAND-PIPE.—Cap., 719,000 galls.; steel, 12 × 85 ft. FISCAL YEAR CLOSED Sept. 10. DISTRIBUTION.—Mains, 4 miles; cost extensions met by revenue. Taps, 110; made by city. Services, ¾-in.; paid for by consumer. Meters: 1; owned, controlled and repairs paid by light plant. City can compel the use of meters and any consumer may have one; compulsory for corporations and hotels. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 120,000; max., 200,000; min., 80,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,184. Expenses: Operating, $1,320. Revenue, Consumers, unmetered, $1,560; metered, $360; street sprinkling, $20 per mo. MANAGEMENT.—Secy., Chas, Bray; Ch. Pump. Engr., J. M. Matthews. Rept. by J. M. Carter, Aug. 31, '96. PROJECTED IMPROVEMENTS.—Settling reservoir. SEWERS.—Has storm sewers.

12. **BRENHAM**, Washington Co. (5,209.) Owned by city since Mar. 15, '95; built in '85 by Co. SUPPLY.—Five surface wells with daily flow of 350,000 galls., pumping to stand-pipe and direct. PUMPS.—Cap., 500,000 galls.; 2—250,000 Dean. Lignite used; av. cost, $2.15 per short ton. STAND-PIPE.—Cap., 115,000 galls.; steel, 14 × 100 ft. FISCAL YEAR CLOSED Mar. 15. DISTRIBUTION.—Mains, 8 miles; cost extensions met by revenue. Taps, 300; made by Co. for $4 including service to sidewalk. Services, iron; paid for by consumer. Meters, 0. Meters are being discussed by council. Hydrants, public, 42. CONSUMPTION.—(Galls.) max., 300,000.; min., 100,000. PRESSURE.—Ordinary, 42 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $67,500. (City bought works for $40,000). Bonded debt, $40,000 at 6%. Expenses, Operating, $2,000. MANAGEMENT.—City Secy., E. H. Evetsberg; Ch. Pump. Eng., Henry Booker. Rept. by Supt., I. N. Bettison, June 14, '96. SEWERS.—None.

13. **BROWNWOOD**, Brown Co. (2,176.) Built in '86-7 by city. SUPPLY.—Pecan River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,250,000 galls.; 1,500,000 and 750,000 Worthington comp. non-cond. Wood used for fuel. STAND-PIPE.—Cap., 235,000 galls.; iron, 20 × 100 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 7 miles. Taps made by consumer, no fee. Services, galv. i.; paid for by property owner. Meters: 6; owned and repairs paid by property owners; controlled by city. Use of meters compulsory for engines of 10-HP. or more. City can compel use of meters in some cases and any consumer may have one. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 275,000; max., 500,000; min., 200,000. PRESSURE.—Ordinary, 44 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $67,000. Debt, $57,000: Floating, $2,000; no int.; Bonded, $55,000 at 5%. Expenses, $5,925: Operating, $2,700; int., $3,225. Revenue, City, $2,645. MANAGEMENT.—City Secy., W. J. Evans; Supt., B. H. Smith; Ch. Pump. Engr., John Kenedy. SEWERS.—None.

14. **BRYAN**, Brazos Co. (2,979.) Bought at receiver's sale by L. T. Fuller, Aug., '96, and the Bryan Water, Ice, Light & Power Co. formed. Built in '89-90 by Bryan Water, Ice & Electric Light Co. City holds lien on plant for amount of bonds issued to Co. in '90; now about $13,000. FRANCHISE.—25 yrs. from '90. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $1,800 per yr. for public service. No legal difficulties. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 750,000 galls.; two Smith & Vaile; also Cook deep well. Press rept., Jan. '97, stated compressor for air-lift for new well had just been received. Brown coal used; av. cost, $1.60 per short ton; wood at $1.75 per cord. RESERVOIR.—Cap., 45,000 galls.; receiving. STAND-PIPE.—Cap., 101,000 galls.; steel; 12 × 120 ft. First fiscal year of new Co. began Oct. 19. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by Co. from fund and by city paying for one hydrant every 280 (?) ft. Taps, 210; made by Co. for $10. Services, ¾-in. iron; paid for by consumer. Meters: 20; owned, controlled and repaired by Co.; yearly rental, 50 to 75 cts. Use of meters compulsory for hotels, livery stables and cer-

tain residences. Co. can compel use of meters and any consumer may have one. Hydrants, public, 15; private, 1. CONSUMPTION.—(Galls.) av., 100,000; max., 125,000; min., 85,000. PRESSURE.—Ordinary, 40 to 80 lbs.; fire, 150 lbs. Steam fire engines are used. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $20,000; paid-up, $11,500. Bonded debt, $13,000, at 6%; due in 1915; balance of loan made Co. by city. Expenses: Operating, $2,000; int., $780; int. on sinking fund, $520; taxes, $260. Revenue, $4,880; Consumers, unmetered, $1,680; metered, $1,400; City, fire protection and sewer flushing, $1,800. MANAGEMENT.—Secy. and Treas., W. E. Saunders; Ch. Pump. Engr., F. C. Cain. Rept. by Prest. and Supt., L. T. Fuller, Calvert, Nov. 9, '96. PROJECTED IMPROVEMENTS.—18-in. artesian well, to increase supply to 350,000 galls. SEWERS.—None.

15. **CALDWELL,** Burleson Co. (1,250.) Built in '92; press repts. indicate that city built plant and leased it to Caldwell Water-Works, Electric Light & Ice Co. in Feb., '93, for 50 yrs.; also that in Aug., '96, city began suit to regain possession of plant, and that immediately afterward Thos. F. Hudson was appointed receiver. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure (rept. by makers). TANK.—Press rept., Jan., '93, stated 50,000-gall. tank had failed, through bursting of hoops. MANAGEMENT.—Address Co. or receiver.

16. **CALVERT,** Robertson Co. (2,632.) Built in '86-7 by Calvert Water, Ice & Electric Light Co. FRANCHISE.—25 yrs. from Feb., '87; does not provide for purchase of works by city. Rates were passed on by city council. Co. is exempt from local taxes for 25 yrs. City to pay $2,020 per yr. for public service. No legal difficulties. SUPPLY.—Two 6-in. artesian wells, pumping to stand-pipe and direct. PUMPS.—Cap., 950,000 galls.; 500,000 and 250,000 high pressure dup. Smith-Vaile and 200,000 deep well Knowles. Brown coal used; av. cost, $1.80 per short ton. RESERVOIR.—Cap., 45,000 galls.; receiving; under pump-house. STAND-PIPE.—Cap., 84,000 galls.; steel; 12 × 100 ft. FISCAL YEAR CLOSED May 5. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by general revenue and charged to improvement acct. Taps, 225; made by Co. at $9 for ¾-in., including service to property line. Services, iron; paid for by consumer from property line. Meters: 45; owned, controlled and repaired by Co.; yearly rental, 50 cts. for ¾-in., 75 cts. for ¾-in. Use of meters optional with consumer; compulsory for public places, hotels, stables, etc. Hydrants, public, 14; private, 3. CONSUMPTION.—(Galls.) av., 125,000; max., 175,000. PRESSURE.—Ordinary, 40 lbs.; fire, 80 to 150 lbs. FINANCIAL.—Cost, $54,865. Cap. Stock: Common, authorized, $50,000; paid-up, $27,000; paid 10% div'd in '95. Bonded debt, $7,500, at 8%; due at option of Co. after '97. Sinking Fund, none. Expenses, $18,805: Operating, $17,740; int., $600; taxes, $465. Revenue, $23,294: Consumers, $6,016; City, fire protection, $2,000; street sprinkling and public buildings, $1,200; others purposes, $14,078. MANAGEMENT.—Secy. and Treas., J. Adorn; Ch. Pump. Engr., A. J. Day. Rept. by Prest. and Supt., L. T. Fuller, June 5, '96. SEWERS.—None.

17. **CAMERON,** Milam Co. (1,608.) Built in '96 by Cameron Water, Power & Light Co.; put in operation May 1. Engr. and Contr., G. Jaeger. FRANCHISE.—25 yrs. from '95 with option of purchase of works by city after 3 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington, a comp. non-cond. and a simple high pressure. Wood used; av. cost, $1.75 per cord. FILTER.—Jackson (Western?). STAND-PIPE.—Cap., 172,000; galls.; 16 × 115 ft. DISTRIBUTION.—Mains, 4 miles; cost extensions met by consumers. Taps, 135; made by Co. for $6. Services, lead and iron; paid for by consumer. Use of meters optional with consumer. Hydrants, public, 31. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock: Authorized, $50,000; paid-up, $22,500. Floating debt, $1,650, at 10%. Expenses, Operating, $2,000. Revenue, $5,280: City, fire protection, $1,600; street sprinkling, $180; other purposes, $3,500. MANAGEMENT.—Secy. and Treas., C. W. Lawrence; Ch. Pump. Engr., Abe. Hedrick. Rept. by Prest. and Supt., C. H. Yoe, June 12, '96. SEWERS.—None.

—. **CASTROVILLE,** Medina Co. (679.) Works reported in '90-1 Manual were sold and pipes taken up. Rept. by Jas. Courand.

—? **CHANNING,** Hartley Co. (Not given.) Construction begun in June, '91, by J. H. Hamlin & Co. Wells pumping to 16,000-gall. reservoir. Mains, 3,000 ft. Cost, $2,000.

18. **CISCO,** Eastland Co. (1,063.) Built in '91 by Cisco Water-Works Co. FRANCHISE.—50 yrs. City to pay $100 per hydrant per yr. SUPPLY.—Surface water, pumping from reservoir to stand-pipe and direct. PUMP.—Cap., 500,000 galls.; Laidlaw-Dunn-Gordon comp. non-cond. RESERVOIR.—Cap., 8,500,000 galls.; area, 18 acres. STAND-PIPE.—Cap., 50,000 galls.; 12 × 60 ft.; on hill 60 ft. above business portion of city. DISTRIBUTION.—Mains, 3.5 miles. Hydrants, public, 12. PRESSURE.—Ordinary, 55 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $25,000. MANAGEMENT.—Prest., O. T. Maxwell; Supt., C. H. Fee. MANAGEMENT.—Rept. by Secy., J. F. Patterson, Sept. 19, '96. NOTE.—Rept. same as for '90-1 Manual, except length of franchise and management.

19. **CLEBURNE,** Johnson Co. (3,278.) Now owned either by city (see below) or by Cleburne Water, Ice & Lighting Co.; built in '83-4 by town. Jan. 7, '91, plant was sold

to S. E. Moss. In July, '91, Mr. Moss sold works to S. W. Lovelady, who, in turn, sold half interest to L. W. Chase, Nov., '91. Lovelady & Chase sold out to Cleburne Water, Ice & Lighting Co., July, '92. Press rept., Feb., '97, stated city had passed resolution to buy works for $80,000. FRANCHISE.—25 yrs. from '91. Rates are regulated by contract with present owners. Co. is exempt from local taxes for 3 yrs. from '91. Water free to city for first three yrs. For two yrs. from Jan. 7, '94, hydrants $25 each per yr. and $40 each thereafter. LEGAL DIFFICULTIES.—Suit brought against city for public service and judgment for year '94 for $1,275 was granted; affirmed recently by Court of Appeals of Texas. SUPPLY.—Six wells, each 1,000 ft. deep, pumping to stand-pipe, tank and direct. PUMPS.—Cap., 3,250,000 galls.; 750,000 comp. non-cond. and 1,500,000 simple high pressure Worthington. Screened lump and Huntington coal used; av. cost, $3½ per short ton, delivered. RESERVOIR.—Cap., 110,000 galls.; receiving. TANK.—Cap., 56,000 galls.; iron, 20 × 24 ft., on circular brick tower 52 ft. high. STAND-PIPE.—Cap., 424,000 galls.; steel; 40 × 45 ft., on hill. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by earnings. Taps, 1,100; made by Co. for $3. Services, iron; paid for by consumer or property owner. Meters: 7; owned, 5 by Co., 2 by consumers; controlled and repaired by Co.; yearly rental, none. Use of meters optional with consumer; compulsory for manufacturers and R. Rs. Hydrants, public, 51; private, 1. CONSUMPTION.—(Galls.) av., 450,000; max., 600,000; min., 300,000. PRESSURE.—Ordinary, 38 lbs.; fire, 70 to 120 lbs. FINANCIAL.—Cost, $112,887. Cap. Stock: Authorized, $100,000; all paid-up. Floating debt, $40,000. Expenses, $11,860: Operating, $6,700; int., $4,800; taxes, $366. Revenue, $11,020: Consumers, unmetered, $9,450; metered, $280; City, fire protection, $1,275; other purposes, $15. MANAGEMENT.—Vice-Prest., V. Gray; Supt., C. B. Wade; Ch. Pump. Engr., F. G. A. White. Rept. by Secy., L. W. Chase, June 8, '96. REFERENCE.—Eng. News, Sept. 13, '84.

20. **COLEMAN,** Coleman Co. (906.) Built in '95 by city; put in operation Oct. 1. Engr., J. S. Thatcher, Dallas. Contr., J. M. Carter, Bowie. SUPPLY.—Filter gallery. pumping to reservoir and direct. PUMP.—750,000-gall. comp. dup. non-cond. Wood used; av. cost, $2.50 per cord. FILTER GALLERY.—Gravel bed in rock tunnel, in bed of Hoards River. RESERVOIR.—Cap., 1,000,000 galls.; 147 ft. above public square and 187 ft. above creek. DISTRIBUTION.—Mains, 8¼ miles. Taps, 200. Services, iron; paid for by consumer. Hydrants, public, 25. PRESSURE.—Ordinary, 62 lbs.; fire, 100 lbs. FINANCIAL.—Cost, about $16,000. Bonded debt, $15,000, at 6%; due in 25 yrs. Sinking Fund invested at 2%. Expenses: Operating, unknown as yet; int., $900. MANAGEMENT.—Mayor, T. W. White. Rept. by Engr., June 30, '96. SEWERS.—None.

21. **COLORADO,** Mitchell Co. (1,582.) Leased by Caldwell & Fletcher; built in '85 by city. LEGAL DIFFICULTIES.—In '90 suit was brought against city by taxpayers. Owing to legal defect charter was cancelled and city left without a government. Works were thus left on hands of lessees, who continued to operate them. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 350,000 galls.; Knowles. STAND-PIPE.—Cap., 285,000 galls.; 22 × 100 ft. DISTRIBUTION.—Mains, 7.5 miles. Taps, 150. Meters, 0. Hydrants, 16. PRESSURE.—(In '88.) Ordinary, 75 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $56,000. Bonded debt, $40,000, at 7%; due in 35 yrs. Expenses, $4,800: Operating, $2,000; int., $2,800. Revenue, $3,000. NOTE.—No rept. since '89-90 Manual.

22. **COLUMBUS,** Colorado Co. (2,199.) Leased to Towell & Shaw for 10 yrs., ending 1905; built in '84 by town. SUPPLY.—Surface well, pumping to tank and direct. PUMPS.—Cap., 350,000 galls.; Blake dup. TANK.—Cap., 52,000 galls.; iron; 20 × 22 ft., on 60-ft. brick tower. DISTRIBUTION.—Mains, 5 miles. Taps, 85. Meters, 0. Hydrants, public, 9. CONSUMPTION.—(Galls.) av., 45,000. PRESSURE.—(In '89.) Ordinary, 35 lbs.; fire, 100 lbs. FINANCIAL.—Cost (in '90), $30,000. Bonded debt, $25,000, at 8%. Expenses: Operating, $460. Revenue: Consumers, $1,500. MANAGEMENT.—Pump. Engr., Josiah Shaw. Rept. by Supt., J. W. Towell, Sept. 19, '96. REFERENCE.—Eng. News, Nov. 8, '84.

23. **CORPUS CHRISTI,** Nueces Co. (4,387.) Built in '93 by city and Co. (see below). Engr., J. S. Peter. Contr., G. Jaeger, Rich Hill, Mo. No legal difficulties. SUPPLY.—Nueces River, pumping to stand-pipe. PUMPS.—Cap., 1,700,000 galls.; two Deane comp. dup. Wood used; av. cost, $1.75 per cord. STAND-PIPE.—Cap., 150,000 galls.; iron. FISCAL YEAR CLOSED Oct. 1, '95. DISTRIBUTION.—Mains, 20 miles. Taps, 100; made by Co. for $1. Services, galv. i.; paid for by consumer. Meters: 40; owned by consumer; controlled by Co.; repairs paid by consumer. Use of meters compulsory for sprinkling lawns. Co. can compel use of meters and any consumer may have one. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 55,000; max., 75,000; min., 35,000. PRESSURE.—Ordinary, 50 lbs.; fire, 65 lbs. One steam fire engine. FINANCIAL.—Cost, $148,000. Cap. Stock: Authorized, $55,000; all paid-up. Expenses: Operating, $3,000. Revenue, street sprinkling, $180. City issued $90,000 bonds; company furnished $58,000 to complete plant holding lien on same until paid, when the plant will be turned over to city. MANAGEMENT.—Prest., Dan Reid; Secy., M. C. Spann; Treas., H. A. Wagner. Rept. by M. C. Spann, Sept. 1, '96. SEWERS.—None.

24. **CORSICANA,** Navarro Co. (6,285.) Built in '84 by Corsicana Water Co. In '94 Corsicana Water Development Co. was incorp. In '95 it was rept. that it had engaged Hiram Phillips, St. Louis, to make plans for works, supply to be from artesian wells.

Jan., '96, press rept. stated the new Co. had bought out the old one, and would turn artesian water into mains. FRANCHISE.—25 yrs. SUPPLY.—Lake, having area of 115 acres, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Worthington, a simple high pressure and a comp. non-cond. STAND-PIPE.—Cap., 235,000 galls.; 20 × 100 ft., hill 45 ft. above surrounding country. DISTRIBUTION.—Mains, 7 miles. Taps, 400. Meters, 0. Hydrants, 61. PRESSURE.—Ordinary, 55 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $250,000. Cap. Stock, $75,000. Bonded debt, $180,000, at 7%. Expenses: Operating, $4,000. Revenue, $15,300: Consumers, $10,000; City, $5,800. NOTE.—No rept. since '89-90 Manual. REFERENCE.—Eng. News, June 28, '84.

D 3. CRAWFORD, McLennan Co. (Est., 476.) Built in '92 by 15 citizens of town. Engrs., Kell & Gibbs, Clifton. Franchise, 50 yrs. from '96. Rates are not subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. Supply, two artesian wells, pumping to tanks. Tanks, cap., 6,600 galls.; two. Mains, 2 miles; cost extensions met by revenue. Taps, 72; made by consumer at cost of $4.50. Services, iron; paid for by consumer. Meters, 0. Pressure, ordinary, 25 lbs. Cost, $6,800. Cap. Stock: Authorized, $7,000; paid-up, $6,300; paid 17% div'd in '95. Bonded debt, $2,200, at 10%; due in '98 and '99. Expenses: Operating, $50; taxes, $40. Revenue, Consumers, $1,000; other purposes, $150. Prest., John B. Nichols; Treas., W. R. Nail; Supt., Geo. C. Gillean. Rept. by Secy., Chas. Brewington, July 25, '96. SEWERS.—None.

25. **CUERO,** De Witt Co. (3,442.) Built in '89-90 by city; put in operation June 1, '90. Prior to this time, fire protection was afforded to small part of town. SUPPLY.—Guadalupe River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Knowles. STAND-PIPE.—Cap., 165,000 galls.; 16 × 110 ft. DISTRIBUTION.—Mains, 7 miles. Taps, 450. Hydrants, public, 60. CONSUMPTION.—(Galls.) av., 500,000. FINANCIAL.—Cost, $43,000. Bonded debt, $39,500. Sinking Fund: $9,500. Expenses, $4,003. Revenue, $1,500 over and above expenses. MANAGEMENT.—Secy., Geo. H. Law; Supt., P. H. Caldwell. Rept. by Mayor, C. A. Summers, Sept. 22, '96.

26. **DALLAS,** Dallas Co. (38,067.) Built in '76 by city. In '90 East Dallas was annexed and works of East Dallas Water Supply Co. were bought by city. SUPPLY.—Impounding reservoir on Elm Fork of Trinity River, pumping to settling reservoirs, thence repumped (direct?). This supply was put in use early in '96. Previously, water was pumped from Trinity River to the present settling reservoir. FORCE MAIN.—36-in. wood stave pipe, about 3 miles long. PUMPS.—Makers rept. (in '96): 8,000,000 and 6,000,000-gall. Holly-Gaskill for high service; Holly high duty hor. engine, with 10,000,000 vert. pumps for low service; 2—2,250,000 Worthington comp. non-cond. RESERVOIRS.—Impounding. Cap., 500,000,000 galls. Settling: Cap., 140,000,000 galls.; 99 ft. above river. STAND-PIPE.—Cap., 150,000 galls.; 15 × 116 ft. DISTRIBUTION.—(In '89.) Mains, 25.3 miles. Taps, 1,764. Meters, 0. Hydrants, 177. PRESURE.—Ordinary, 50 lbs. FINANCIAL.—Cost (in '89), $350,000. Bonded debt (in '89), $295,000; $195,000 at 6%; $100,000, at 5%. Expenses ('95-6), $56,365: Operating, $21,365; int., $35,000; also $35,000 was paid to sinking fund. Revenue, $88,849: Consumers, $65,329; City, $23,520. MANAGEMENT.—(Apr., '96.) Supt., J. M. Strong. No official rept. since '89-90 Manual; information regarding new supply, expenses and revenue from local press repts. REFERENCES.—Eng. News, Oct. 21, '82; cost of pipe, June 8, '93; tests of pumps, July 27, Aug. 10, '93.

27. **DECATUR,** Wise Co. (1,746.) Built in '83 by A. R. Whitehead. SUPPLY.—Two deep wells, pumping to reservoir and direct. An 80,000-gall. tank and 36,000-gall stand-pipe previously rept. PUMPS.—Cap., 250,000 galls.; Cook deep well and 250,000 Smith-Vaile for fire purposes. DISTRIBUTION.—Mains, 2½ miles. Taps, 400. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 60,000. PRESSURE.—Ordinary, 60 lbs.; fire, 180 lbs. FINANCIAL.—Cost, $21,000. Expenses, operating, $1,200. Revenue, $6,200: Consumers, $4,200; City, fire protection, $2,000. MANAGEMENT.—Rept. by Owner, A. B. Whitehead, Sept. 21, '96.

28. **DEL RIO,** Val Verde Co. (1,980.) Built in '83 by Galveston, Harrisburg & San Antonio Ry. Co. SUPPLY.—Springs, pumping to tank. PUMP.—Cap., 700,000 galls.; Worthington comp. non-cond. TANK.—Cap., 10,000 galls. DISTRIBUTION.—Mains, 10 miles. Taps, 150. Meters, 0. Hydrants, 30. FINANCIAL.—Cost, $3,500. Revenue: Consumers, $2,600; City, $1,050; total, $3,650. NOTE.—No rept. since '89-90 Manual. Address C. C. Gibbs, Land Comr. of above Ry., San Antonio.

29. **DENISON,** Grayson Co. (10,958.) Built in '86-7 by Denison City Water Co. FRANCHISE.—25 yrs. from '86. Rates are subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Impounding reservoir and wells, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly-Gaskill hor. rotative. Makers also rept. 2,500,000 Worthington comp. cond. Bituminous coal used; av. cost, $3.50 per short ton. RESERVOIR.—Cap., 400,000,000 galls. (press rept.). STAND-PIPE.—Cap., 152,000 galls.; 15 × 115 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 16 miles; cost extensions met by income. Taps, 1,000. Services, iron; paid for by consumer. Meters: 900 owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 125. PRESSURE.—Ordinary, 75 lbs.; fire, 125 lbs. FINANCIAL.—Cap. Stock: Authorized, $200,000; all paid-up. Bonded debt, $200,000, at 6%. Expenses, $33,000: Operating, $20,000; int., $12,000; taxes, $1,000. MANAGEMENT.—Prest., H. S.

Hopper; Secy. and Treas., Walter Wood; Supt., M. J. Fitzgerald. SEWERS.—Has sanitatry sewers only.

30. **DENTON,** Denton Co. (2,558.) Built in '92 by Denton Water, Light & Power Co.; put in operation July 1. Engr. and Contr., W. J. Williams, Dallas. FRANCHISE.—20 yrs. from '92. SUPPLY.—Artesian well, pumping to reservoir, tank and direct. PUMPS. —Cap., 1,146,000 galls.; 2—570,000 Deane dup., one being comp. McAllister coal used; av. cost, $2.50 per short ton. RESERVOIR.—Cap., 100,000 galls. STAND-PIPE.—Cap., 84,-000 galls.; iron; 12 × 100 ft., on concrete foundation. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by revenue. Taps, 350; made by consumer, no fee to Co. Services, w. i.; paid for by consumer. Meters: 15; owned and repaired by consumer; controlled by Co. Co. cannot compel, but may prohibit use of meters; compulsory for gins, yards, stables and sprinkling. Hydrants, public, 44; private, 2. CONSUMPTION.—(Galls.) av., 50,000; max., 75,000; min., 25,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. MANAGEMENT.—Prest., T. J. Oliver; Secy., A. F. Evers; Treas., H. F. Schweer; Supt., H. C. Stowie. Rept. by Co., Jan. 27, '97.

31. **DUBLIN,** Erath Co. (2,025.) Built in '92 by Dublin Light & Water Co. Engr., J. S. Thatcher, Dallas. Contrs., S. S. Mayo & Co., Ft. Worth. FRANCHISE.—30 yrs. from '96. SUPPLY.—Surface water, pumping to stand-pipe and direct. PUMP.—Cap., 800,000 galls.; Buffalo dup. Av. cost of coal used, $4 per short ton. RESERVOIR.—Impounding; area, 32 acres. STAND-PIPE.—Cap., 50,000 galls.; steel; 12 × 60 ft., on hill about 60 ft. above business center. DISTRIBUTION.—Mains, 3 miles. Meters, 0. Hydrants, public, 12; private, 4. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL. Cost, $30,000. Cap. Stock: Authorized, $40,000; all paid-up. Bonded debt, $30,000. MANAGEMENT.—Prest., H. A. Smith. Secy., W. B. Davis; Supt., J. H. Latham. Rept. by Supt., June 12, '96, and Des. Engr., Jan., '93. SEWERS.—None.

32. **EAGLE PASS,** Maverick Co. (Est., 2,729.) Built in '84 by Eagle Pass Water Supply Co. Press rept. states property was sold Nov. 5, '95, under judgment of court, subject to $20,000 mortgage, to L. Debona. FRANCHISE.—40 yrs.; does not provide for purchase of works by city. Rates are not subject to regulation by city. SUPPLY.—Rio Grande River, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Worthington comp. non-cond. FILTERS.—Gravel and sand. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 6.5 miles. Taps, 310. Hydrants, 2. PRESSURE.—Ordinary, 40 lbs.; fire, 65 lbs. FINANCIAL.—Cost, $41,993. Cap. Stock, $20,000. Floating debt, $1,690. Bonds for $20,000 at 8%, due in '99, had been issued ,but not sold Nov. 8, '90. Expenses, $3,012. Operating, $2,622; taxes, $390. Revenue, $6,843. NOTE.—No rept. since '90-1 Manual.

33. **EDDY,** McLennan Co. (Not given.) Built in '92-3 by Eddy Artesian Well Co.; put in operation Jan. 10, '93. FRANCHISE.—10 yrs. from '93. SUPPLY.—Flowing artesian well, cap. 600,000 galls., by natural pressure, direct to mains. FISCAL YEAR CLOSED Jan. 10. DISTRIBUTION.—Mains, ⅛ mile; cost extensions met by earnings. Taps, 80. Services, iron; paid for by consumer. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 100,000; max., 600,000; min., 10,000. PRESSURE.—Ordinary, 35 lbs. FINANCIAL. —Cost, $7,000. Cap. Stock: Authorized, $20,000; paid-up, $7,000; paid 9% div'd in '95. Expenses, $867; Operating, $825; taxes, $42. Revenue: Consumers, $1,200. MANAGEMENT.—Secy., F. P. Kincannon; Treas., Terrell Jackson; Supt., Arthur Carney. Rept. by Prest., J. M. Bedichek, Aug. 21, '96.

34. **ELGIN,** Bastrop Co. (Est., 831.) Sold in '93 to Jno. Andrewartha, who improved works; built in '92 by city. SUPPLY.—Shallow wells, pumping to tank.

35. **EL PASO,** El Paso Co. (10,338.) Built in '82 by El Paso Water Co. Contract was let in '92 or early in '93 for city works (see legal difficulties) and municipal plant was again proposed in '95. FRANCHISE.—50 yrs.; exclusive for 15 yrs. LEGAL DIFFICULTIES.—Co. secured injunction in Feb., '93, against issuance of $205,000 city bonds for competing works; court held indebtedness limit would be exceeded. SUPPLY.—Rio Grande River, pumping to reservoir. PUMPS.—Cap., 4,250,000 (?) galls. 1,500,000 and 2,000,000 Gordon; rept. by makers; 1,750,000 Smith & Valle rept. in '89. RESERVOIRS.—Cap., 6,000,000 galls.; three, settling and distributing; about 200 ft. above city. DISTRIBUTION.—Mains, 10 miles. Taps, 800. Meters: 450. Hydrants, public, 44. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—(In '89.) Ordinary, 74 lbs. FINANCIAL.—Cost, $120,000. Cap. Stock (in '88), $20,000. Bonded debt, $80,000, at 6%. Expenses, $19,800: Operating, $15,000; int., $4,800. Revenue, $27,000. MANAGEMENT.—Treas. and Supt., W. H. Watts. NOTE.—Information from previous Manuals. Inquiry was returned by Supt., endorsed: "We do not care to make any report." REFERENCE.—Eng. News, Nov. 17, '83.

36. **ENNIS,** Ellis Co. (2,171.) Owned by Co. and city (see reservoir); built in '91 by Ennis Ice, Light & Water Co.; put in operation Sept. 1. FRANCHISE.—30 yrs. SUPPLY. —Lake, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; two dup., make not given, but makers rept. 500,000 Worthington comp. non-cond. RESERVOIR.—(New). Area, 72 acres; earth dam 917 ft. long and 40 ft. high in center; water 34 ft. deep; owned by city; cost, about, $20,000. Connected with old system by 7,000 ft. of 8-in. mains. Engr., J. S. Thatcher, Dallas. STAND-PIPE.—Cap., 84,000 galls., 12 × 100 ft. DISTRIBUTION.—(In '90.) Mains, 4.8 miles. Hydrants, 32. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cost, $64,000. Cap. Stock: Authorized, $75,000; paid-up, $34,000.

Bonded debt, $30,000, at 7%. Hydrant rental, $65. NOTE.—No rept. since '90-1 Manual, except regarding new reservoir.

D 4. **FERRIS,** Ellis Co. (311.) Built in '94 by Mutz & Cassidy; put in operation in '94. Engr., G. E. Cassidy. No franchise. No legal difficulties. Supply, artesian well, pumping with hydraulic ram to 47,000-gall. stand-pipe, of steel, 10 × 80 ft. Mains, 2 miles. Taps, 150. Services, iron; paid for by property owner. Meters, 0. Consumption, av., 25,000 galls. Pressure, 35 lbs. Revenue, Consumers, $1,200. Rept. by owners, Dec. 16, '96. No sewers.

37. **FORT WORTH,** Tarrant Co. (23,076.) Bought by city prior to '89, probably about '88; built by Co. in '82-3. SUPPLY.—Thirteen 8-in. × 960 (av.)-ft. artesian wells, daily flow, 1,000,000 galls.; also four storage and impounding dams on Clear Fork of Trinity River; pumping to stand-pipe. PUMPS.—Cap., 21,000,000 galls.; 3,000,000 Holly quadruplex; 2,000,000 Worthington comp. non-cond. 2—8,000,000 Holly vert. trip exp. McAllister slack used; av. cost, $2.75 per short ton. RESERVOIRS.—Cap., 175,000,000 galls.; four impounding and storage. STAND-PIPE.—Cap., 305,000 galls.; iron; 20 × 130 ft., on rock foundation 12 ft. deep. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 53 miles. Taps, 2,379; made by city at $2.50 for ½-in., $3 for ⅝-in., $3.50 for ¾-in. and $4 for 1-in. Services, iron; paid for by consumer. Meters: 74; owned, 7 by consumers, 67 by city; repaired by city. Use of meters compulsory for office buildings. City can compel use of meters and any consumer may have one. Hydrants, public, 465. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 120 lbs. Steam fire engines are sometimes used. FINANCIAL.—Bonded debt, $800,000: $150,000, at 7%; due 1903; $650,000, at 6%, due 1922. Expenses, $72,471: Operating, $22,971; int., $49,500. Revenue, $55,143: Consumers, $54,519; City, fire protection, $27,650. MANAGEMENT.—Treas., John T. Montgomery; Secy., H. L. Calhoun; Ch. Pump. Engr., Robt. De Haven. Rept. by Supt., A. W. Scoble, June 30, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Aug. 2, '84; reservoir and meters, Jan. 10, '95.

P 2. **FRANKLIN,** Robertson Co. (665.) Town proposes to build works in '97. Supply, well, by pumping.

38. **GAINESVILLE,** Cooke Co. (6,594.) Built in '83-4 by Gainesville Water Co. FRANCHISE.—50 yrs. SUPPLY.—Elm River and artesian well, pumping direct. PUMP.—(In '89.) Cap., 1,500,000 galls.; Holly-Gaskill hor. high duty. RESERVOIRS.—Cap., 115,000,000 galls. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 11.4 miles. Taps, 500. Meters, 300. Hydrants, public, 120. PRESSURE.—Ordinary, 40 to 60 lbs.; FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jos. Nalle. Rept. by Secy. and Supt., Michael Chevalin, Nov. 9, '96.

39. **GALVESTON,** Galveston Co. (29,084.) First supplied in '84 by Galveston Water Co. Present works built in '88-9 by city. New supply developed in '94-5; Des. Engr., Wynkoop Kiersted, Kansas City, Mo. Const. Engrs., H. T. Wilson and R. H. Peck. Contrs., J. W. Byrnes & Co. and McRitchie & Nichols, Chicago, Ill. SUPPLY.—Thirty artesian wells, located on mainland, 18½ miles from pumping station, by gravity and natural pressure; daily flow, 4,500,000 galls. Flowing through 30-in. cast-iron conduit to distributing reservoir and stand-pipe. In '89 supply was developed from artesian wells on the island on which the city is built. Aug. 19, '95, supply was turned on from source as described above. PUMPS.—Cap., 6,000,000 galls.; 2—3,000,000 comp. cond., dup. Knowles. Georges Creek, Cumberland coal used; av. cost, $4.15 per short ton. RESERVOIR.—Cap., 1,175,000 galls.; distributing, located at pumping station. STAND-PIPE.—Cap., 550,000 galls.; steel; 25 × 150 ft., on stone and concrete foundation. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 38 miles; cost extensions met by bonds. Taps, 1,300; made by city at $3 to $10, for ⅝-in. to 2-in. Services, lead and w. i.; paid for by consumer. Meters: 50; owned, controlled and repaired by city; yearly rental, none; compulsory for hotels, livery stables, R. R., large barrooms and other large consumers. City can compel use of meters and any consumer may have one by buying it. Hydrants, public, 387; private, 25 to 30. CONSUMPTION.—(Galls.) av., 1,500,000; max., 2,250,000; min., 1,000,000. Consumption is rapidly increasing since introduction of new supply. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Steam fire engines are used on wharf front. FINANCIAL.—Cost, $1,360,000. Sinking Fund, provided for by taxation. Expenses: Operating, $25,000. Revenue, $50,000: Consumers, unmetered, $32,000; metered, $18,000. All expenses are met by general taxation. MANAGEMENT.—Prest., Chas. Fowler; Secy., Geo. B. Dermody; Ch. Pump. Engr., Thos. McArdle. Rept. by Supt., R. H. Peck, Sept. 2, '96. PROJECTED IMPROVEMENTS.—Issue of $100,000 in bonds has been authorized for further extension. SEWERS.—Small private sewer co. in business part of city; limited storm sewers. REFERENCE.—Wells, Eng. News, Aug. 11, '92, illus.

40. **GATESVILLE,** Coryell Co. (1,375.) Built in '92 by Gatesville Water & Ice Co.; put in operation May 15. Engr., J. S. Thatcher, Dallas. Contr., S. S. Mayo, Fort Worth. FRANCHISE.—19 yrs. from '91. Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $500 per yr. No legal difficulties. SUPPLY.—Artesian well, pumping to stand-pipe and direct. PUMP.—Cap., 300,000 galls.; Chapman dup. Av. cost of coal used $5 per short ton. STAND-PIPE.—Cap., 51,000 galls.; steel; 12 × 60 ft. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 6½ miles. Taps, 325; made by Co. Services, galv. i.; paid for by property owner. Meters, 0. Co. can

compel use of meters and any consumer may have one. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 50,000; max., 75,000; min., 35,000. PRESSURE.—Ordinary, 26 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $45,000. Cap. Stock: Paid-up, $43,000; paid no div'd in '95. Floating debt, $5,500. Expenses, $2,580: Operating, $2,000; int., $500; taxes, $80. Revenue: Consumers, $4,500. MANAGEMENT.—Prest., W. E. Brown; Secy., N. F. Fouts; Treas., J. R. Roby; Supt., Chas. Coruth. Repts. by Engr., July, '96, and Prest., Sept. 15, '96. SEWERS.—None.

41. **GEORGETOWN,** Williamson Co. (2,447.) Bought in Nov., '93, by holders of city bonds, consideration being the cancelling of the bonds, amounting to $40,000. (Press rept.). Built in '84 by city and leased prior to '89 to San Gabriel Water-Works Co., which operated plant until its sale. SUPPLY.—San Gabriel River, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Worthington (makers rept. instead 1,000,000 comp. cond. and 750,000 high pressure Worthington). Lignite used; av. cost, $1.17 per short ton. STAND-PIPE.—Cap., 235,000 galls.; iron; 20 × 100 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by hydrant rental. Taps, 400; made by Co. Services, w. i.; paid for by consumer. Meters: 20; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for large consumers. Hydrants, public, 20; private, 1. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock: Authorized, $100,000; paid-up, $72,000. Bonded debt, $72,000, at 6%. MANAGEMENT.—Prest., Bird S. Coles, New York; Ch. Pump. Engr., J. M. Aday. Rept. by Secy. and Supt., E. E. Taylor, June 9, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Feb. 7, '85.

D 5. **GIDDINGS,** Lee Co. (1,206.) Built in '96 by Co. for domestic supply to 12 stockholders. Supply, well, 5½ × 315 ft., pumping to tank. Pump, cap., 5,000 galls.; Goulds, driven by 7-HP. Otto gasoline engine. Tank, cap., 12,000 galls.; cypress; on 40-ft. wood trestle. Mains, 6,000 ft. of w. i. Pressure, 30 lbs. Cost, $2,500. Prest., W. H. Cherry. Rept. by Secy. and Treas., J. S. Hillsman, June 29, '96. No sewers.

42. **GOLIAD,** Goliad Co. (Est., 885.) Built in '96 by Goliad Water-Works Co.; put in operation in Apr. FRANCHISE.—30 yrs. from '95; does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service other than for fire hydrants. No legal difficulties. SUPPLY.—San Antonio River, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Laidlaw-Dunn-Gordon (rept. by makers). Wood used. STAND-PIPE.—Cap., 90,000 galls.; 12½ × 100 ft. high, on elevation 35 ft. above city. DISTRIBUTION.—Hydrants, public, 12. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Jno. W. Cole; Rept. by Secy. and Treas., J. H. Ewell, Jan. 10, '97.

43. **GONZALES,** Gonzales Co. (1,641.) Built in '84 by Gonzales Water-Works Co. FRANCHISE.—99 yrs. from '84; does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay for watering troughs. No legal difficulties. SUPPLY.—Guadalupe River, pumping to stand-pipe and direct. PUMPS.—Cap., 1,950,000 galls.; 750,000 and 1,200,000 Laidlaw-Dunn-Gordon. Water power and steam. Wood used. STAND-PIPE.—Cap., 67,000 galls.; steel, 12 × 80 ft. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 10½ miles; cost extensions met by revenue. Taps, 400; made by consumer for $1.25 to $3. Services, iron; paid for by consumer or property owner. Meters, 0. Hydrants, public, 24. CONSUMPTION.—(Galls.) max., 600,000; min., 300,000. PRESSURE.—Ordinary, 42½ lbs.; fire, 120 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock: Authorized, $20,000; all paid-up; paid 9% div'd in '95. Bonded debt, $5,000, at 8%; due in 1900. Expenses, $2,650: Operating, $2,000; int., 400; taxes, $250. Revenue, $6,300: Consumers, $6,000; public buildings, $300. MANAGEMENT.—Prest., T. F. Harwood; Secy. and Treas., Jos. Sayers. Rept. by Supt., R. H. Walker, June 4, '96. SEWERS.—None. REFERENCE.—Eng. News, Nov. 22, '84.

44. **GREENVILLE,** Hunt Co. (4,330.) Built in '88-9 by Greenville Water & Electric Light Co. FRANCHISE.—30 yrs. from '89. City to pay $5,000 per yr. for public service. SUPPLY.—Cowleach Fork of Sabine River, pumping from impounding reservoir through filter to stand-pipe. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Buffalo comp. cond. high duty. FILTERS.—Cap., 800,000 galls.; American (New York). RESERVOIR.—Cap., 300,000,000 galls.; impounding, formed by brick dam. STAND-PIPE.—Cap., 172,000 galls.; 15 × 130 ft. DISTRIBUTION.—Hydrants, public, 60; private, 4. CONSUMPTION.—(Galls.) av., 175,000; max., 200,000; min., 97,000. PRESSURE.—Ordinary, 50 lbs.; fire, 75 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000. Bonded debt, $100,000, at 6%. MANAGEMENT.—Vice-Prest. and Mgr., Chas. H. Ledlie, St. Louis, Mo.; Secy., J. D. Lasater; Supt., Frank Owen; Asst. Mgr., Maxime Reber, St. Louis. Rept. by Mgr., June 6, '96.

45. **GROESBECK,** Limestone Co. (663.) Built in '93 by city. Engr. and Contr., O. J. Gorman, Dallas. SUPPLY.—Springs, pumping to stand-pipe. PUMPS.—Cap., 150,000 galls.; Smith-Vaile. Wood used; av. cost, $2 per day. STAND-PIPE.—Cap., 84,000 galls.; iron; 12 × 100 ft. DISTRIBUTION.—Mains, 1½ miles. Taps, 60; made by consumer for $9. Services paid for by consumer. Meters: 2; owned by consumer; controlled and repaired by city at expense of consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 25,000. PRES-

SURE.—Ordinary, 45 lbs. FINANCIAL.—Sinking Fund: $1,200. Expenses, $800: Operating, $750; taxes, $50. MANAGEMENT.—Secy., L. L. Brown; Treas., D. Oliver. Rept. by Supt. and Pump. Engr., F. E. Shanks, Aug. 29, '96. SEWERS.—None.

46. **HALLETTSVILLE,** Lavaca Co. (1,011.) Built in '91 by city. SUPPLY.—Artesian well, pumping from reservoir to stand-pipe. PUMP.—Cap., 500,000 galls.; Knowles comp. dup. RESERVOIRS.—Cap., 120,000 galls.; 18 × 16 ft. STAND-PIPE.—Cap., 85,000 galls.; 12 × 100 ft. DISTRIBUTION.—Mains, 2 miles. Hydrants, 25. FINANCIAL.—Cost, $14,750. Bonded debt, $15,950, at 6%. No rept. since '90-1 Manual.

P 3. **HEMPSTEAD,** Waller Co. (1,671.) Works are projected by a Co. Supply, artesian well.

47. **HENRIETTA,** Clay Co. (2,100.) Built in '94 by city; put in operation in June. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 (?) galls.; two Deane dup. rept. by makers; also 2—240,000 Hooker (deep well?). Indian Terr. coal used; av. cost, $3.20 to $4 per short ton. RESERVOIR.—Cap., 50,000 galls. STAND-PIPE.—Cap., 84,000 galls.; iron; 12 × 100 ft. DISTRIBUTION.—Mains, 3 miles. Taps, 100; made by city for $2.50. Services paid for by consumer. Meters: 40; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 23. PRESSURE.—Ordinary, 50 lbs.; fire, 100 to 150 lbs. FINANCIAL.—Bonded debt, $18,000: $15,000, at 6%; due in 50 yrs.; $3,000 at 6%; due in 30 yrs. from '98. Sinking Fund, none. Expenses, Operating, $960. Sinking fund and int. are raised by taxation; running expenses from rentals. MANAGEMENT.—Prest., M. G. Wining; Secy., Supt. and Ch. Pump. Engr., P. M. Andrain. SEWERS.—None.

P 4. **HICO,** Hamilton Co. (649.) Town was to receive bids for works on Apr. 12, '97. Engr., J. S. Thatcher, Dallas. Supply, deep well, pumping to 12 × 50-ft. stand-pipe on hill 85 ft. above town. Mains, 3,500 ft. Hydrants, 7. Bids were also to be received for $7,500 of 5%, 40-yr. bonds. Cy. Secy., G. W. Hall. Rept. by Engr., Mar. 15, '97.

48. **HILLSBORO,** Hill Co. (2,541.) Built in '95-6 by city; put in operation Feb. 1. Engr., D. A. Poynor. SUPPLY.—Artesian well, 1,850 ft. deep; dy. cap., 175,000 galls., pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Worthington comp. non-cond. Bituminous nut coal used; av. cost, $3.50 per short ton. RESERVOIRS.—Cap., 60,000 galls.; storage. STAND-PIPE.—Cap., 133,000 galls.; steel; 14 × 115 ft. DISTRIBUTION.—Mains, 4 miles; cost extensions met by issuing bonds. Taps, 150; made by city at $3.50 for ½-in.; $4.00 for ¾-in.; $5.00 for 1-in. Services paid for by property owner. Meters: Owned by consumer; controlled by city; repairs paid for by owner. Use of meters optional with consumer. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 175,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. One steam fire engine. FINANCIAL.—Cost, $38,000. MANAGEMENT.—Rept. by Supt., O. J. Morris, June 12, '96. PROJECTED IMPROVEMENTS.—Extension of mains and a new well. SEWERS.—Has sanitary and storm sewers.

—? **HONDO CITY,** Medina Co. (Not given.) Press repts. indicate that works were built in '91-2 by Hondo City Water-Works Co. No response to inquiries.

49. **HOUSTON,** Harris Co. (27,557.) Built in '78-9 by Houston Water-Works Co. FRANCHISE.—25 yrs. from '78; provides for purchase of works by city after 25 yrs. Rates are subject to regulation by city only for private residences. Co. is not exempt from local taxes. City to pay $18,000 per yr. for public service. No legal difficulties. SUPPLY.—Thirty-eight artesian wells, from 140 to 1,200 ft. deep, dy. flow, 8,000,000 galls., pumping to stand-pipe and direct. PUMPS.—Cap., 15,500,000 galls.; 1,500,000, 5,000,000 and 8,000,000 comp. cond., latter a high duty; 2—500,000 simple high pressure. Wood used; av. cost, $2.50 per cord. STAND-PIPE.—Cap., 793,000 galls.; steel; 30 × 150 ft.; on concrete foundation and piling. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 60 miles; cost extensions met by individuals. Taps, 2,000; made by Co. at cost. Services, w. l.; paid for by consumer. Meters: 12; owned, controlled and repaired by Co.; yearly rental, 75 cents to $2. Use of meters compulsory for hotels and stables. Co. can compel use of meters and any consumer may have one. Hydrants, public, 495; private, 60. CONSUMPTION.—(Galls.) av., 4,500,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., T. H. Scanlon; Secy., C. H. Sprong; Treas., T. W. House; Supt., F. J. Smith; Ch. Pump. Engr., John Cresney. PROJECTED IMPROVEMENTS.—Steel storage tanks will probably be built. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 22, '82.

P 5. **HUBBARD CITY** (P. O. Hubbard), Hill Co. (894.) Hubbard City Water Co. has sunk well 3,200 ft. deep, with dy. flow of 75,000 galls. It is unable to put in works and wishes to lease well for a time to some one who will do so. Latest rept. by Secy., J. M. Carroll, Dec., 97.

P 2. **HUNTSVILLE,** Walker Co. (1,509.) Fire protection is afforded a part of city by works built for state penitentiary in '84. A 12 × 6 × 12-in. Gardner underwriters pump lifts water to a 16 × 85-ft. stand-pipe. There is also an air-lift pump. City has 5 hydrants.

—? **ITASCA,** Hill Co. (548.) Press repts. in '92 stated water was secured in artesian well at 1,800 ft., and that mains were being laid. Bids were to be received Apr. 1, '97, for a pump, boiler and stand-pipe, "together with an electric light plant." Mayor, C. C. Weaver.

D 6. **KARNES CITY,** Karnes Co. (Not given.) Built in '94 by Karnes City Water-Works Co., for domestic use. Supply, well, pumping to tank.

—?, P 6. **KERRVILLE,** Kerr Co. (1,044.) Kerrville Water-Works Co. was incorp. in '94, with authorized cap. stock of $20,000, by Chas. Schreiner, Nathan Herzog and others. In '96, citizen rept. works on a small scale were owned and operated by Chas. Schreiner, a water-power pump lifting water from well. Later rept., apparently from Mr. Schreiner, stated works were temporary, but that construction of good system in '97 was proposed.

50. **KYLE,** Hays Co. (779.) Built in '87-8 by Kyle Water Co. SUPPLY.—Rio Blanco River, pumping to tanks. PUMPS.—Cap., 100,000 galls.; Deane. TANKS.—Two; cap., 63,000 galls. FISCAL YEAR CLOSED Oct. 27. DISTRIBUTION.—Mains, 7.9 miles. Meters, 12. Hydrants, public, 11. CONSUMPTION.—(Galls.) av., 50,000. FINANCIAL.—Cost, $12,000. Bonded debt, $4,500. Expenses, $1,400. Revenue, $2,500. MANAGEMENT.—Secy., Wm. Groos; Supt., A. Sim. Rept. by Prest., Otto Groos, Sept. 21, '96.

51. **LA GRANGE,** Fayette Co. (1,626.) Press rept. states water and electric light plants were bought in '95 by Taylor & Bradshaw; built about '92 by city. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure (rept. by maker). FILTERS.—Cap., 250,000 galls.; American or National (New York, rept. by maker).

52. **LAMPASAS,** Lampasas Co. (2,408.) Bought in '94 by Lampasas Water, Ice & Light Co.; built in '85 by town. SUPPLY.—Sulphur Creek, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Worthington, a comp. non-cond. and a simple high pressure. STAND-PIPE.—Cap., 115,000 galls.; 20 × 50 ft. DISTRIBUTION.—Mains, 6.5 miles. Taps, 182. Meters, 9. Hydrants, 25. PRESSURE.—(In '88.) Ordinary, 40 to 50 lbs.; fire, 100 to 120 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $40,000, at 7%. Expenses, $4,800: Operating, $2,000; int., $2,800. Revenue, $3,000. NOTE.—No rept. since '90-1 Manual, except regarding change in ownership. June, '94, J. W. Martin was Prest. of the Co.

P 7. **LANCASTER,** Dallas Co. (741.) Lancaster Water, Light & Ice Co. incorp. in '95. June 11, '95, Will A. Strain, Secy., rept. well had been sunk, but owing to lack of interest nothing further had been done or was in prospect.

53. **LAREDO,** Webb Co. (11,319.) Built in '83-4 by Laredo Water Co. FRANCHISE.—Provides for purchase of works by city in 1900, price to be determined by three disinterested persons. Rates are fixed in franchise. City to pay $45 each for first 200 hydrants and $25 for each additional. SUPPLY.—River and wells, pumping to stand-pipe. PUMPS.—Cap., 4,500,000 galls.: 1,500,000 Worthington comp. cond.; 2—1,500,000 Blake, comp. dup. TANK.—Cap., 85,000 galls.; steel, 20 × 40 ft. over all, with spherical bottom; on 4 steel columns, making bottom 85, and top, 120 ft., above foundations. Engr., Edw. Flad, St. Louis. DISTRIBUTION.—Meters: 100; owned, controlled and repaired by Co. Use of meters compulsory for irrigation purposes. CONSUMPTION.—(Galls.) av., 700,000; max., 1,800,000; min., 500,000. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 125 to 150 lbs. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $140,000; paid-up, $36,000; paid no div'd in '90. Debt, $152,377; Floating, $5,377. Bonded, $97,000; $90,000, at 8%; $7,000 at 7%, all due 1903. Expenses, $20,506: Operating, $12,547; int., $7,200; taxes, $759. Revenue, $28,511: Consumers, $9,526; City, fire protection, $9,385; other purposes, $8,800. REFERENCES.—Eng. News, Aug. 23, '84; tank, Mar. 8, '94, illus.

54. **LEWISVILLE,** Denton Co. (498.) Built in '95 by an unincorporated Co.; put in operation Jan., '96. Engr., E. M. Masters. Contr., G. W. Wilson. SUPPLY.—Artesian well, 5 ins. × 200 ft., pumping to tank. PUMP.—Windmill, 1¾-in. cylinder. FILTER.—Cap., 4,000 galls. TANK.—Cap., 26,000 galls.; wood; on wooden tower 50 ft. high. DISTRIBUTION.—Mains, 1,000 ft.; cost extensions met by revenue from sale of water. Taps, 12. Services, iron; paid for by consumer. Hydrants, public, 3. CONSUMPTION.—(Galls.) av., 4,000. FINANCIAL.—Cost, $1,400. MANAGEMENT.—Secy., G. W. Elbert; Treas., Jas. Hayes. Rept. by Prest., J. N. Kealy, Aug. 28, '96. SEWERS.—None.

D 7. **LIBERTY HILL,** Williamson Co. (309.) Built in '93 by Bryson & Atwood; put in operation Mar. 1. Engr. and Contr., T. N. Bryson. Franchise, rates are not subject to regulation by city. Co. is not exempt from local taxes and does no public service. No legal difficulties. Supply, Gabriel River, pumping to tank. Pumps, cap., 100,000 galls.; 60,000 Gardner and 40,000 Worthington. Wood used as fuel. Tank, cap., 8,000 galls.; cypress wood; on 40-ft. tower. Mains, 2 miles. Taps, 56; made by owners of works. Services, w. i.; paid for by consumer. Meters, 0. Hydrants, public, 4; private, 4. Consumption (galls.), av., 8,000; max., 15,000; min., 5,000. Supplies two gins and mills at 50 cts. per day, each. Cost, $3,500. No debt. Secy., E. Atwood; Ch. Pump. Engr., Archie Atwood. Rept. by Mgr., T. N. Bryson, Jan. 13, '97. Sewers, none.

D 8. **LLANO,** Llano Co. (Est. 812.) Built in '86 by W. W. Knowles & Son. Supply, Llano River, pumping to tank. Mains, 3 miles. Taps, 60. Meters, 1. Hydrants, 0. Cost, $4,000. Rev., $1,000. No official rept. since '90-1 Manual. Press rept. in '98 stated new pump had been bought.

D 9. **LOCKHART,** Caldwell Co. (1,233.) Owned by Dr. W. F. Blunt, Galveston; built in '87 by Lockhart Water Supply Co. Supply, well, pumping to tank. Two hydraulic rams lift water into 8,000-gall. tank, 70 ft. high. Mains, 1 mile. Taps (in '88), 24. Cost, $5,000. No rept. since '90-1 Manual. Dec., 95, 10-yr. franchise was granted

to Smith & Erickson, of Clifton. Feb., '97, W. R. Parker, Cy. Secy., rept. firm failed to build, and that field was open to good water-works man.

D 10. **LORENA,** McLennan Co. (Not given.) Built in '95 by Lorena Water Co. Supply, artesian well, flowing direct to mains. Prest., H. Schaefer; Supt., R. A. Gordon. Rept. by Secy., H. J. Hudson, Aug. 29, '96. No sewers.

—? **LOTT,** Falls Co. (Not given.) Built in '94 by Lott City Water Co. PUMP.—Driven by 10-HP. engine. RESERVOIR.—Cap., 25,000 galls.

55. **LULING,** Caldwell Co. (1,792.) Built in '90-1 by Luling Water-Works Co. FRANCHISE.—50 yrs. SUPPLY.—San Marcos River, pumping to stand-pipe. PUMPS.—Cap., 500,000 galls.; Deane dup. water-power. STAND-PIPE.—Cap., 85,000 galls.; 12 x 100 ft. DISTRIBUTION.—Taps, 75. Hydrants, 10. PRESSURE.—Ordinary, 45 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $23,000. Cap. Stock: Authorized, $50,000; paid-up, $7,500. Bonded debt, $16,500. NOTE.—No rept. since '90-1 Manual.

56. **M'GREGOR,** McLennan Co. (774.) Built in '91 by McGregor Artesian Well Co. FRANCHISE.—50 yrs. from '91; does not provide for purchase of works by city. Rates are not subject to regulation by city. Co. is exempt from local taxes for 10 yrs. City to pay $300 per yr. for 4 hydrants, $100 for public watering trough and $15 for school; 20-yr. contract. No legal difficulties. SUPPLY.—Two artesian wells, pumping to tank. PUMP.—Cap., 200,000 galls.; Chapman air lift. McAllister nut coal used; av. cost, $5 per short ton at bins. TANK.—Cap., 55,000 galls.; cypress wood; 24 x 16 ft., on tower 34 ft. high; elev., 49 ft. above town. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 8 miles. Taps, 250; made by Co., free. Services, 2-in. pipe; paid for by Co. to curb line. Meters, 0. Use of meters optional with Co. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 40,000; max., 75,000; min., 25,000. PRESSURE.—Ordinary, 35 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $25,000; paid-up, $10,000. Floating debt, $650, at 10%. Expenses, $1,450: Operating, $1,400; taxes, $50, state and county. Revenue, $3,515: Consumers, unmetered, $3,200; City, fire protection, $300; public buildings, $15. Franchise requires city to pay $300 int. on bonds if any are issued and if requested to by the Co. MANAGEMENT.—Prest., W. R. Blairloch; Ch. Pump. Engr., Grant White. Rept. by Secy. and Supt., Chas. F. Smith, Aug. 29, '96. SEWERS.—None.

P 8. **MANOR,** Travis Co. (405.) Manor Water-Works Co. was incorp. in '95. In '96, H. E. Lancaster, Secy., rept. well had been sunk 1,600 ft., and was being carried deeper. Nothing to be done until water is secured.

D 11. **MARBLE FALLS,** Burnet Co. (587.) Built in '94 by Ice, Light & Water Co.; put in operation Sept. 1. Co. owns 750-HP., ready for wheels. Rates are not subject to regulation by city. Co. is exempt from local taxes. No legal difficulties. Supply, Colorado River, pumping from flume to small reservoir. Pumps, Goulds 4-in. single acting, driven by Leffel water wheel. Tank, cap., 10,000 galls.; cypress. Mains, 3½ miles. Taps, 50; made by Co. Services, black; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Consumption, (Galls.) av., 10,000; max., 15,000; min., 5,000. Cost, $7,000. Cap. Stock: authorized, $50,000; Floating debt, $3,500. Expenses, $1,100: Operating, $785; int., $280; taxes, $35. Revenue, Consumers, $1,200. Prest., A. R. Johnson, Burnet; Secy., Supt. and Ch. Pump. Engr., R. E. Johnson; Treas., W. H. Badger. Rept. by Co., June 15, '96. No sewers.

F 3. **MARLIN,** Falls Co. (2,058.) Built since '92 by city for fire protection. Supply, Artesian wells (hot water), direct pressure of 147 lbs. Hydrants, 25. Pressure, Ordinary, 97 lbs.; fire, 147 lbs. Debt: Floating, $25,000, at 6%; Bonded, $23,000, at 6%; due 1912. Rept. by W. W. Allen, Clk.; June 11, '96. No sewers.

57. **MARSHALL,** Harrison Co. (7,207.) Built in '88-9 by city. Bids were to be received in Nov., '94, for lease of works for 5 yrs. from Jan. 1, '95. SUPPLY.—24 driven wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane. STAND-PIPE.—Cap., 165,000 galls.; 15 x 125 ft. DISTRIBUTION.—Mains, 8 miles. Taps, 330. Meters: 3. Hydrants, 52. PRESSURE.—(In '88.) Ordinary, 50 to 200 lbs. FINANCIAL.—Cost, $67,000. Bonded debt, $62,000 at 6%; due in 1929. Expenses, $7,300. Revenue, City, none. NOTE.—No official rept. since '90-1 Manual.

58. **MEXIA,** Limestone Co. (1,674.) Built in '87-8 by Mexia Water, Ice & Light Co. FRANCHISE.—Does not provide for purchase of works by city. Rates must not exceed those of other cities similarly situated. SUPPLY.—Springs, system of gang wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,000,000 galls.; Smith & Vaile. STAND-PIPE.—Cap., 86,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 5 miles. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 50,000. FINANCIAL.—Cost, $40,000. Cap. Stock: Common, authorized, $30,000; all paid-up. On account of developing new water supply no dividend has been paid since '94. All earnings have been paid out in improvements. Bonded debt, $18,500 at 5%; due in 1927. Sinking Fund: $3,500, loaned at 10%. MANAGEMENT.—Prest., D. M. Prendergast; Treas., R. E. Moss. Rept. by Secy. and Supt., Jno. R. Corley, Sept. 21, '96.

D 12. **MIDLOTHIAN,** Ellis Co. (297.) Built in '94 by town. Supply, well, 750 ft. deep, pumping to tank. Pump, cap., 80,000 galls. Av. cost of coal used, $4 per short ton. Tank, cap., 20,000 galls.; wood. Services paid for by town. Meters, 1; compulsory

for steam engines. Town can compel use of meters and any consumer may have one. Consumption, av., 20,000 galls. Cost, $3,000. No div'd in '95. Cannot issue bonds or assess a water tax. Rept. by Mayor, J. M. Bickers, Aug. 24, '96. No sewers.

59. **MINERAL WELLS,** Palo Pinto Co. (577.) Built in '95 by city; put in operation in Aug. Engr. and Contr., O. J. Gorman, Dallas. SUPPLY.—Well, 8 ins. × 165 ft., pumping to stand-pipe. PUMP.—Cap., 100,000 galls.; deep well. STAND-PIPE.—Cap., 185,000 galls.; steel, 30 × 35 ft., on hill 195 ft. high. DISTRIBUTION.—Mains, 2½ miles. City can compel use of meters and any consumer may have one. Hydrants, public, 15. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $12,000. Bonded debt, $10,000 at 6%. MANAGEMENT.—Mayor, R. E. Hendry; Cy. Clk., J. T. Harris. Rept. by Engr., Dec. 15, '96. SEWERS.—None.

D 13. **MOODY,** McLennan Co. (432.) Built in '95 by unincorporated Co.; put in operation in Sept. Engr., J. C. Reynolds. Franchise, 10 yrs. from '95. Supply, artesian well, pumping to stand-pipe. Pumps, cap., 40,000 galls.; deep well. MacAllister coal used; av. cost, $6 per short ton. Stand-pipe, cap., 10,000 galls.; wood; 23 × 24 ft., on tower 75 ft. high. Mains, 3 miles. Taps, 200 (?). Use of meters optional with consumer. Hydrants, public, 1. Consumption, av., 25,000 galls. Steam fire engines are used. Cost, $40,000 ($4,000?). Cap. Stock, paid-up, $4,000. No debt. Revenue, $1,500. Prest., C. T. Wallace; Secy., W. F. Johnson; Supt. and Ch. Pump. Engr., C. R. Willis. Rept. by Treas., J. C. Reynolds, June 1, '96. No sewers.

60, D 14. **MORGAN,** Bosque Co. (426.) Built in '96 by J. C. Little & E. F. Goodwin, under franchise granted in '95; was to be in operation Aug. 1. SUPPLY.—Artesian wells, natural pressure, direct. FINANCIAL.—Cost, $30,000. MANAGEMENT.—As above. Rept. by Cy. Clk., July 21, '96.

DOMESTIC WORKS.

Built in '89 by J. Muirhead under 15 yrs. exclusive franchise. Village controls rates. Flowing artesian well, by gravity to tank. Mains, 2 miles. Taps, 41. Cost, $4,000. No debt. No rept. since '90-1 Manual.

P 9. **NACOGDOCHES,** Nacogdoches Co. (1,138.) Nacogdoches Water Co. was incorp. in Sept., '95, with authorized cap. stock of $10,000, by W. U. Perkins, F. C. Ford and others. Press rept., June, '96; stated construction had been started. Oct., '96, citizen rept. he thought water would be pumped to tanks and that works would cost $10,000.

61. **NAVASOTA,** Grimes Co. (2,997.) Leased to E. L. Bridges; built in '86-8 by city. LEASE.—25 yrs. from '88. Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $1,200 per yr for public service. SUPPLY.—Artesian wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,750,000 galls.: 500,000 Blakeslee; 1,250,000 Smith-Vaile. Wood used; av. cost, $1.25 per cord. STAND-PIPE.—Cap., 84,000 galls.; 12 × 100 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by Lessee. Taps, 420; made by Lessee for $7.50. Services, lead and galv. i.; paid for by consumer. Meters, 5; owned by consumer. Hydrants, public, 16; private, 2. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 44 lbs.; fire, 100 lbs. FINANCIAL.—Expenses, Operating, $6,500. Revenue from water and lights, $11,000. Net income, $4,500. Rept. by Lessee, July 6, '96. PROJECTED IMPROVEMENTS.—Boring a new 8-in. well at present. SEWERS.—None.

62. **NEW BRAUNFELS,** Comal Co. (1,608.) Built in '86 by town. SUPPLY.—Comal River, pumping to stand-pipe, and direct. PUMP.—Cap., 1,150,000 galls.; Knowles 720,000 and 430,000. STAND-PIPE.—Cap., 220,000 galls.; steel; 25 × 60 ft. FISCAL YEAR CLOSED July 1, '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by cash. Taps, 280; made by consumer. Services, w. i.; paid for by consumer. Hydrants, public, 43; private, 5. CONSUMPTION.—(Galls.) av., 200,000; max., 800,000; min., 50,000. PRESSURE.—Ordinary, 40 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $32,000. Debt, $31,700: Floating, $12,000 at 6%; Bonded, $19,700 at 6%. Expenses, Operating, $2,800. Revenue, Consumers, $4,800. Deficits are met by general taxation. MANAGEMENT.—Secy., A. Homann. Rept. by Supt. and Chf. Pump. Engr., C. Ulses, June 18, 96. PROJECTED IMPROVEMENTS.—New pump.

63. **OAK CLIFF** (Station A, Dallas P. O.), Dallas Co. (2,470.) Built in '94 by Oak Cliff Water Supply, Electric Light & Power Co.; put in operation in Jan. Engr., J. S. Thatcher, Dallas; Contrs., Ellmore Iron Wks., Ala. FRANCHISE.—25 yrs. from '94; provides for purchase of works by city. Rates are fixed by city council. Co. is not exempt from local taxes. City to pay $1,500 per yr. for 40 hydrants. City owns part of works and leases to the Co. No legal difficulties. SUPPLY.—Springs and two artesian wells about 700 ft. deep, pumping to stand-pipe. PUMPS.—Cap., 1,500,000 galls.; 2—750,000. Bituminous slack used; av. cost, $2.75 per short ton. RESERVOIRS.—Cap., 500,000 galls.; storage. STAND-PIPE.—Cap., 118,000 galls.; steel, 15 × 90 ft., 215 ft. above pumps. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 17 miles; cost extensions met by earnings. Taps, 400; made by Co. Services, iron; paid for by consumer. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 300,000; max., 400,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $50,000. Cap. Stock: authorized, $50,000; all paid-up; paid no div'd in '95. Bonded debt, $510,000: $500,000, at 6%; due 1911; $10,000, at 10%; due any time after 10 yrs. Expenses, Operating, $2,600. Revenue, City,

fire protection, $1,600. MANAGEMENT.—Prest., J. T. Dargan, Atlanta, Ga.; Secy., and Supt., G. R. Carelton; Treas., J. S. Armstrong. Rept. by J. S. Thatcher, C. E., Sept. 14, '96. SEWERS.—None.

P 10. **ORANGE,** Orange Co. (3,173.) Dec. 10, '96, B. C. Miller, Mayor, rept. that owing to burning of high school building city would be unable to raise money for works. Press repts., Jan., '97, stated Orange Ice, Light & Water-Works Co. offered to build works if city would give it 20-yr. contract for 35 hydrants and pay some of the hydrant rental in advance.

64, P 11. **PALESTINE,** Anderson Co. (5,838.) In hands of receiver; owned by C. S. Greeley and others of St. Louis; built in '81-2 by Palestine Water Co. Press rept. states receiver was appointed in Apr., '96, city having refused to pay int. on bonds, and threatening to annul franchise unless repairs were made. FRANCHISE.—50 yrs. from '81; permits purchase of works by city at end of 10 yrs., and each 5 years thereafter. Rates are fixed in franchise. Co. is not exempt from local taxes. Annual contract made with city for fire protection. LEGAL DIFFICULTIES.—Suit now pending to forfeit franchise. SUPPLY.—Springs, feeding artificial lake, and stored rainwater (?), pumping to stand-pipe and direct from storage reservoirs. PUMP.—Cap., 1,690,000 galls.; Deane comp. dup. RESERVOIRS.—Cap.,120,000,000 galls.; 3—40,000,000 storage. STAND-PIPE.—Cap., 507,000 galls.; iron, 24 × 150 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 12 miles. Taps, 500; made for consumer by plumbers; fee to works 50 cents. Services, w. i.; paid for by property owner. Meters: 50; owned, controlled and repaired by Co.; yearly rental, $3. Use of meters compulsory for livery stables and manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 42. CONSUMPTION.—(Galls.) av., 400,000; max., 750,000; min., 250,000. PRESSURE.—Ordinary, 60 lbs.; fire, 110 lbs. FINANCIAL.—Cost, about, $210,000. Cap. Stock: authorized, $150,000; all paid-up. Bonded debt, $78,000 at 6%; due in 1910. Revenue, City, fire protection, $1,680; sewer flushing, $120; other purposes, $40. MANAGEMENT.—Prest., C. S. Greeley; Secy., Dwight Treadway; Treas., M. J. Shelley, all of St. Louis, Mo. Rept. by Receiver, H. L. Wright, June 5, '96. PROJECTED IMPROVEMENTS.—Increase of storage capacity, filters and general improvements to begin at an early date. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, July 22, '82.

PROJECTED WORKS.

In Aug., '95, city council voted to issue $100,000 of bonds, and advertised for bids for works. Press rept., Sept. 24, '96, stated contract had been let to J. W. Byrnes, Galveston, at $90,000 in cash or bonds, supply to be from wells; also that city refused Co.'s offer to sell works.

65. **PARIS,** Lamar Co. (8,254.) Now owned by city; built in '88 by city and Paris Water Co.; for a time plant was leased to J. D. Thomas. SUPPLY.—Wells and tunnels, pumping to stand-pipe. PUMPS.—Cap., 2,000,000 (?) galls.; Worthington (makers rept. 1,000,000 comp. non-cond., 1,000,000 and 1,200,000 simple high pressure). Ind. Terr. coal used; av. cost, $3 per short ton, f. o. b. RESERVOIR.—Cap., 1,350,000 galls.; storage 80 × 36 ft. STAND-PIPE.—Cap., 305,000 galls.; 20 × 130 ft. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 11 miles; cost extensions met by taxation and revenue. Taps, 430; made by city, at cost. Services, galv. i. and lead; paid for by consumer or property owner. Meters: 322; owned, controlled and repaired by city. Use of meters compulsory for all except offices. City can compel use of meters and any consumer may have one. Hydrants, public, 99. CONSUMPTION.—(Galls.) av., 80,000; max., 110,000; min., 60,000. PRESSURE.—Ordinary, 55 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $92,000. Bonded debt, $84,000 at 6%. MANAGEMENT.—Rept. by Supt., Jno. A. Porter. PROJECTED IMPROVEMENTS.—Sinking of artesian well. SEWERS.—Has sanitary sewers only.

P 12. **PITTSBURG,** Camp Co. (1,203.) Dec. 11, '96, F. H. Goodjohn, Mayor, rept. that city council proposed to contract in spring of '97 for combined water and electric light plant.

P 13. **PLANO,** Collin Co. (842.) Mar. 15, '97, J. S. Thatcher, Dallas, rept. he was making surveys and plans for works, which will probably include 500,000-gall. pump, 12 × 80-ft. stand-pipe, about 1 mile mains and 10 hydrants.

P 14. **RANGER,** Eastland Co. (Est., 527.) Ranger Water-Works Co. incorp., Jan., '97, by W. C. Moore, W. R. Hodges and others. Jan. 15, '97, J. S. Thatcher, Dallas, rept. he was making plans (not saying for whom) for gravity works, including 15-acre reservoir formed by earth dam 555 ft. long and 31 ft. high; 4,500 ft. mains and 5 hydrants. Est. cost, $8,000.

P 15. **RICHMOND,** Fort Bend Co. (993.) May 2, '96, Jas. F. Weed, Houston, rept. Richmond Water-Works Co. had been incorp., and had just accepted two artesian wells with dy. cap. of 50,000 galls. each; also that he was making plans and specifications, works to cost about $10,000.

66. **ROCKDALE,** Milam Co. (1,505.) Built in '91-2 by Rockdale Water-Works Co. for general supply; put in operation in Feb. FRANCHISE.—25 yrs. SUPPLY.—Well, pumping to stand-pipe 110 ft. high.

P 16. **RODGERS,** Bell Co. (Est., 286.) J. S. Thompson expects to build works. Supply, artesian well, by natural pressure. At time of rept. well was down 1,600 ft.; water was expected at 1,800 to 2,000 ft. Three hydrants proposed, and also domestic supply. Est. cost, $3,000. Rept. by Supt. Frank Leahy, Feb. 3, '97. No sewers.

D 15. **ROSEBUD,** Falls Co. (Not given.) Built in '96 by Crawford Greer for domestic supply. No franchise. Town to pay $300 per yr. Supply, dammed underflow of dry branch, pumping from impounding reservoir to 15,000-galls. cypress tank, 12 x 16 ft., on 40-ft. wood trestle. Mains, ¾ mile. Taps, 50. Services, ½-in.; paid for by consumer. Revenue, Consumers, $900. Rept. by owner, Dec. 17, '96.

P 17. **RUNGE,** Karnes Co. (Not given.) Works projected by Co., which was being organized at time of rept. Est. cost, $5,000. Rept. by E. G. Gillett, Feb. 1, '97.

67. **SAN ANGELO,** Tom Green Co. (2,615.) Built in '84 by San Angelo Water-Works Co. In '90 cap. stock was increased to $120,000. During '91 system was completely remodelled. FRANCHISE.—50 yrs. SUPPLY.—North Concho River, pumping to tank and direct. Press repts. in '92 indicated that source had been changed to Concho River, where dam for power purposes had been built. PUMP.—Cap., 1,000,000 (?) galls.; 500,000 Deane comp. dup. rept. in '89; also the same rept. by makers as furnished in '92. TANK.—(In '89.) Cap., 60,000 galls.; wood, 24 x 18 ft. STAND-PIPE.—Cap., 70,000 galls.; 120 ft. high. DISTRIBUTION.—(In '88.) Mains, 4 miles. Taps, 138. Meters, 6. Hydrants, 44. FINANCIAL.—Cap. Stock, $120,000. MANAGEMENT.—Address J. S. Millspaugh. NOTE.—No official rept. since '90-1 Manual.

68. **SAN ANTONIO,** Bexar Co. (37,673.) Built in '78-9 by San Antonio Water-Works Co. FRANCHISE.—50 yrs. from '78; provides for purchase of works by city in 1908 and every 5 yrs. thereafter, price to be determined by arbitration. Rates are not fixed in franchise nor subject to regulation by city. Co. has new contract with city for 9 yrs. from June 4, '94. SUPPLY.—Nine artesian wells, 8, 10 and 16-in., av. depth 900 ft. pumping direct and to reservoir by steam and electric power and by water power when available. PUMPS.—Makers rept.: 3,000,000-gall. Allis hor., furnished since '90; three 10 x 12-in. Goulds pumps, driven by electric motor; and seven Worthington. Latter as follows: 2—1,500,000, 1,250,000 and 1,000,000 dup. power; 1,000,000 dup. water motor pump; 5,000,000 hor. triple exp. high duty and 1,500,000 comp. cond. RESERVOIR.—(In '89.) Cap., 5,000,000 galls.; 150 ft. above city. DISTRIBUTION.—Mains, 110 miles. Taps, 7,800. Meters, 50. Hydrants, public, 750. FINANCIAL.—Revenue: City, for all public purposes, $24,000. MANAGEMENT.—(In '90.) Prest., Geo. W. Breckenridge; Secy., J. Ulrich. SEWERS.—Has Sewers. REFERENCES.—Eng. News, Mar. 17, '83; electric pumping plant, Sept. 26, '95.

69. **SAN MARCOS,** Hays Co. (2,335.) Built in '83 by San Marcos Water Co. SUPPLY.—San Marcos River, pumping to reservoir and direct. PUMPS.—Cap., 1,750,000 galls.: 750,000 Worthington dup. water power; 1,000,000 Gordon & Maxwell. RESERVOIR.—(In '89.) Cap., 230,000 galls.; 60 x 9 ft.; 190 ft. above pumps and 162 ft. above town. DISTRIBUTION.—Mains, 10 miles. Taps, 506. Meters, 15. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 750,000. FINANCIAL.—Cost, $68,000. Cap. Stock, $25,000. Bonded debt, $25,500, at 7%. Expenses, $3,285: Operating, $1,500; int., $1,785. Revenue, $7,700: Consumers, $6,275; City, fire protection, $1,425. MANAGEMENT.—Prest., W. O. Hutchinson; Treas., Ed. J. L. Green; Supt., Eugene Green; Actg. Supt. and Mech. Engr., Robt. Pettit. Rept. by Secy., Wm. Green, Sept. 21, '96. REFERENCE.—Eng. News, Sept. 13, '84.

—? **SAN SABA,** San Saba Co. (697.) Built in '84 by Jno. H. Brown. No legal difficulties. SUPPLY.—Large spring, pumping direct. PUMP.—Water power. Rept. by Jno. Seiders, Secy. Bd. of Trade, June 12, '96. SEWERS.—None.

70. **SEGUIN,** Guadalupe Co. (1,716.) Built in '86-7 by Seguin Water & Ice Co. FRANCHISE.—20 yrs. SUPPLY.—Guadalupe River, pumping to stand-pipe and direct. PUMPS.—Cap., 4,000,000 galls.: 1,500,000 Gordon & Maxwell water-power and steam, rept. in '89; makers rept. 1,000,000 and 1,500,000 Gordon added in '92 and '93. STAND-PIPE.—Cap., 58,000 galls.; 10 x 100 ft. DISTRIBUTION.—Mains, 10 miles. Taps, 200. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $35,000. Cap. Stock, $25,000. Bonded debt, $19,000, at 7%. MANAGEMENT.—Rept. by Gen. Mgr., Jos. T. Holmes, Sept. 21, '96.

71. **SHERMAN,** Grayson Co. (7,335.) Built in '87-8 by city. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 950,000 galls.; 750,000 comp. non-cond. and 200,000 Worthington. STAND-PIPE.—Cap., 400,000 galls.; 150 ft. high. DISTRIBUTION.—Mains, 14 miles. Taps, 1,300; made by licensed plumber for consumer. Services paid for by consumer. Meters, 200; owned, controlled and repaired by city; yearly rental, $8. Use of meters compulsory for factories and mills. City can compel use of meters and any consumer may have one. Hydrants, public, 130. CONSUMPTION.—(Galls.) av., 900,000. PRESSURE.—Ordinary, 70 lbs.; fire, 200 lbs. Steam fire engines are used. FINANCIAL.—Cost, $100,200. Expenses: Operating, $6,000. MANAGEMENT.—Rept. by Supt., Wm. Tolson, June 5, '96. SEWERS.—None.

72. **SONORA,** Sutton Co. (Est., 200.) Built in '95 by T. D. Newell. FRANCHISE.—10 yrs. from '95. Co. is not exempt from local taxes. Cost of fire protection met by pri-

vate subscriptions. SUPPLY.—Two 4-in. driven wells, dy. flow, 86,000 galls., pumping to reservoir. Wood used; av. cost, $3 per cord. RESERVOIR.—Cap., 100,000 galls.; 42 ft. in diam.; covered. FISCAL YEAR CLOSED Nov. 12. DISTRIBUTION.—Mains, 2,000 ft. Taps, 10; made by proprietor, free. Services, ¾-in. galv. i.; paid for by consumer. Meters, 0. Hydrants, 6. CONSUMPTION.—(Galls.) av., 10,000; max., 20,000; min., 7,000. FINANCIAL.—Cost, $8,500. Revenue: Consumers, $18,000. Rept. by T. D. Newell, July 7, '96. NOTE.—Small plant described in former Manuals as having been built in '89 by Sonora Water-Works Co. Above rept. received in response to inquiries regarding old Co.

F 4. **SUBLIME,** Lavaca Co. (Est., 210.) Built in '93 by merchants for fire protection. Supply, well, lifted by windmill pump to tank 30 ft. high. Pipe is "laid to three places near the stores." Hydrants, 3. Rept. by W. C. Fernan.

73. **SULPHUR SPRINGS,** Hopkins Co. (3,038.) Built in '95 by city; put in operation about June. Engr., H. A. Evans. Contr., O. J. Gorman, Dallas. SUPPLY.—Four 20 × 20 to 24-ft. wells, pumping to stand-pipe and direct. PUMP.—Cap., 400,000 galls.; 250,000 Laidlaw-Dunn-Gordon dup. Wood used; about 1½ cords used daily. STAND-PIPE.—Cap., 100,000 galls.; steel; 12 × 120 ft. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains, about 2 miles; cost extensions met by revenue. Taps, 90; made by city at cost of about $5. Services, galv. i.; paid for by consumer. Meters, 7; owned and controlled by city; no yearly rental. City can compel use of meters and any consumer may have one if Supt. so recommend; compulsory for R. R. and livery stables. Hydrants, public, 17. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 40 lbs.; fire, 110 lbs. Steam fire engines are used in district not supplied by mains. FINANCIAL.—Cost, $12,500. Rept. by Jno. D. Williams and H. A. Evans, Jan., '97. PROJECTED IMPROVEMENTS.—Dam 12 ft. high, 300 ft. long, forming impounding reservoir of 12 acres area. SEWERS.—Has storm sewers only.

74. **TAYLOR,** Williamson Co. (2,584.) Built in '82-3 by Taylor Water Co.; stock owned now by G. W. Burkitt and D. Murphy, Sr. FRANCHISE.—50 yrs.; does not provide for purchase of works by city. LEGAL DIFFICULTIES.—City refused to pay for public service; compromise effected. SUPPLY.—Artesian wells, springs and San Gabriel River, pumping to reservoirs, stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.: 1,000,000 Worthington comp. non-cond.; 1,000,000 (?) Deane. McAllister lump coal used; av. cost, $4.50 per short ton. RESERVOIRS.—Two storage. STAND-PIPE.—Cap., 242,000 galls.; steel; 20 × 103 ft. DISTRIBUTION.—Mains, 10¼ miles. Taps, 300; made by consumer, no fee. Services paid for by consumer. Meters, 51; owned by Co. and consumers; yearly rental, $3. Co. can compel use of meters and any consumer may have one. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 42 lbs. FINANCIAL.—(In '90.) Cost, $97,000. Cap. Stock: Authorized, $100,000; paid-up, $33,000. Debt, $45,600: Floating, $5,600. Bonded, $40,000, at 6%, due in 20 yrs.; $20,000 in bonds still unsold. Expenses, $3,560: Operating, $2,000; int., $1,200; taxes, $360. Revenue, $10,965; Consumers, $4,000; City, fire protection, $2,065; other purposes, $4,900. MANAGEMENT.—Prest., G. W. Burkitt; Vice-Prest., D. Murphy, Sr.; Mgr., D. Murphy, Jr. Rept. by Co., July 8, '96. SEWERS.—Has storm sewers only.

75. **TEMPLE,** Bell Co. (4,047.) Built in '84 by Temple Water-Works Co. FRANCHISE.—50 yrs.; does not provide for purchase of works by city. SUPPLY.—Surface wells, pumping to stand-pipe. Press rept. states artesian well was sunk in '93 and a 30 × 110-ft. underground reservoir built. PUMPS.—Cap., 1,500,000 galls.: 750,000 Worthington comp. non-cond.; 750,000 Deane comp. dup. direct pressure. STAND-PIPE.—Press rept., Apr., '94, stated 240,000-gall. stand-pipe had just been accepted from Contrs. The original stand-pipe failed, Oct. 26, '90. DISTRIBUTION.—Mains, 13 miles. Taps, 247. Meters, 0. Press rept. in '95 stated Co. had adopted meter system for all but residences. Hydrants, 27. PRESSURE.—(In '88.) Ordinary, 53 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $97,000. Cap. Stock: Common, authorized, $100,000; paid-up, $33,000; paid no div'd in '90. Debt, $45,600; Floating, $5,600. Bonded, $40,000, at 6%; due in 20 yrs. Expenses, $3,560: Operating, $2,000; int., $1,200; taxes, $360. Revenue, $10,965: Consumers, $4,000; City, fire protection, $2,065; other purposes, $4,900. NOTE.—No official rept. since '90-1 Manual. REFERENCES.—Stand-pipe failure, Eng. News, Apr. 11, '91, Apr. 26, '94, illus.

76. **TERRELL,** Kaufman Co. (2,988.) Press repts. indicate that city regained control of works in '95; built in '84 by city; leased in '91 to Terrell Ice, Light & Water Co., for 30 yrs. SUPPLY.—Two wells, 25 × 27 ft., with wells 45 ft. deeper bored in bottom, pumping to stand-pipe and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington simple high pressure. STAND-PIPE.—Cap., 45,000 galls.; 10 × 75 ft., on ground 75 ft. above pump. DISTRIBUTION.—Mains, 5 miles. Taps, 95. Meters, 1. Hydrants, 32. FINANCIAL.—Cost (in '88), $37,200. Bonded debt, $20,000, at 7%. Sinking Fund, $14,000. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Oct. 24, '85.

18. Ark. **TEXARKANA** (P. O. Texarkana, Ark.), Bowie Co. (6,380.) See Texarkana, Ark.

F 5. **TEXAS CITY,** Galveston Co. (Not given.) Built in '96 by Inman Terminal & Dock Co. for the fire protection of their cotton sheds and warehouses. Supply, three flowing artesian wells, pumping to tank. Two of the wells are 4½ ins. × 905 ft. and flow

about 150,000 galls. per day, each. Other well is 3 ins. in diam. A 24,000-gall. hydraulic ram lifts water to 40,000 wood tank on 50-ft. wood tower. Hydrants, public, 2; private, 4. Pressure, 25 lbs. Cost, $3,500 to $4,000. V.-Prest. and Gen. Mgr., J. R. Myers; Secy., H. S. Moody. Rept. by C. L. Crandall, Jan. 29, '97. Co. projects works for domestic use in near future. Supply from artesian well, pumping to storage reservoir or stand-pipes. Texas City Improvement Co. will probably put in, during '97, a similar system for fire protection of their warehouses and docks. No sewers, but material is on hand for 5,000 ft. of 12-in. sanitary sewers.

D 16. **THURBER,** Erath Co. (978.) Built in '96 by Texas & Pacific Coal Co. to supply mining town with water for drinking and steaming purposes. Supply, impounding reservoir. Rept. by citizen, Oct. 22, '96.

P 18. **TRINITY,** Trinity Co. (856.) Trinity Water-Works Co. was organized about Nov., '94. Dec., '94, A. T. Anderson, Prest., rept. works were being put in. Jan. 12, '97, R. T. Walker stated work was begun winter of '95-6, but stopped on account of financial depression. Big artificial lake has been built and it is hoped that works can be completed in '97. Water will be pumped to elevated tank.

—? **TROY,** Bell Co. (219.) A flowing artesian well was sunk in '95 by Troy Artesian Water Co., and drinking water is furnished by it. No pumping at present. Cost, $5,000.

77. **TYLER,** Smith Co. (6,908.) Built in '83 by Tyler Water Co. Works were begun by city, but sold to Co. before completion. FRANCHISE.—50 yrs. from '83. Rates are not fixed in franchise. Co. is exempt from local taxes. City to pay $50 per hydrant per yr. for 100 hydrants. LEGAL DIFFICULTIES.—Quo warranto proceedings for forfeiture of charter instituted by city in Aug., '93; "works improved and action dismissed." Press rept., Mar., '97, stated city refused to pay Co. money due it, and Co. shut off all hydrants for two or three days, an agreement being reached meanwhile. SUPPLY.—Creek, pumping from impounding reservoir to stand-pipe and direct. PUMPS.—Cap., 2,650,000 (?) galls.: 650,000 and 2,000,000 Worthington comp. non-cond. Wood used; av. cost, $2.40 per cord. RESERVOIRS.—Cap., 550,000,000 galls.; impounding; 500,000,000 and 50,000,000; former has area of 177 acres and av. depth of 10 ft. STAND-PIPE.—Cap., 397,000 galls.; 35 × 55 ft. DISTRIBUTION.—Taps, 800. Meters, 19; owned by Co. and consumers; controlled and repaired by Co.; yearly rental, 20%. Use of meters compulsory for manufactories and R. Rs. Co. can compel use of meters and any consumer may have one. Hydrants, public, 100; private, 5. CONSUMPTION.—(Galls.) av., 750,000; max., 1,200,000; min., 300,000. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—(In '90.) Cost, $114,000. Cap. Stock: Common, authorised, $100,000; all paid-up. Bonded debt, $100,000, at 7%; due 1908. Expenses, $11,940: Operating, $4,700; int., $7,000; taxes, $240. Revenue, $12,000: Consumers, $7,000; City, fire protection, $5,000. MANAGEMENT.—Prest., Benj. B. Cain; Supt., H. J. Harding. Rept. by Secy. and Treas., W. Frank Knox, June 19, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Sept. 13, '84.

78. **UVALDE,** Uvalde Co. (1,265.) Built in '91 by Uvalde Water Supply & Power Co. Press repts. state works were sold in '91 or '92 to satisfy judgment of $10,076 in favor of San Antonio National Bank; that water and ice plants were combined and electric lighting plant built by Uvalde Water, Ice & Electric Light Co., which was incorporated in Dec., '94. SUPPLY.—Livara River, pumping to stand-pipe. PUMP.—Cap., 500,000 galls.; Worthington simple high pressure (rept. by makers). FINANCIAL.—Cost, est., $19,000. NOTE.—No rept. since '90-1 Manual.

D 17. **VALLEY MILLS,** Bosque Co. (300.) Owned by Valley Mills Water Co. since June 1, '96; built in '93 by A. A. McNeill. Supply, three artesian wells. Tank, cap., 10,000 galls.; cypress. Mains, 3 miles. Taps, 90; made by Co. for $4. Services paid for by consumer. Meters, 0. Consumption, (galls.) av., 75,000; max., 150,000; min., 25,000. During the summer irrigation of gardens is allowed. Pressure, 30 to 50 lbs. Cost, $7,500. Cap. Stock: Paid-up, $7,500; paid 20% div'd in '95. Secy., Alex. McNeill. Rept. by Prest., A. A. McNeill, Aug. 24, '96. No sewers.

79. **VERNON,** Wilbarger Co. (2,857.) Built in '90 by Vernon Ice, Light & Power Co. In '91 city bought the water-works, but it was decided that bonds issued were in excess of debt limit. Apparently works reverted to Co., for in Aug., '92, press rept. stated one receiver had resigned and another been appointed. SUPPLY.—Wells, pumping to stand-pipe. PUMPS.—Cap., 1,250,000 galls.; Deane dup. STAND-PIPE.—Cap., 115,000 galls.; 14 × 100 ft. DISTRIBUTION.—Mains, 2.5 miles. Taps, 40. Hydrants, 41. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $25,000. Bonded debt, $23,500, at 6%. Expenses, $3,000. Revenue, $3,000: Consumers, $1,500; city, $1,500. NOTE.—No rept. since '90-1 Manual.

80. **VICTORIA,** Victoria Co. (3,046.) Built in '85 by city. SUPPLY.—Guadaloupe River, pumping to stand-pipe and direct. PUMPS.—Cap., 2,700,000 galls.; 1,500,000 and 1,250,000 comp. non-cond. Worthington; latter contracted for in '96 to replace 2—500,000 Blake, which were to be sold. Wood used; av. cost, $2.50 per cord. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. DISTRIBUTION.—Mains, 7 miles. Taps, 283; made by city for $1. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 77; private, 3. CONSUMPTION.—(Galls.) av., 125,000; max., 300,000; min., 75,000. PRESSURE.—Ordinary, 30 to 45 lbs.; fire, 100 to 125 lbs. FINANCIAL.—Bonded debt, $34,-

000 at 6%; due in 1915, or option in 1925. Sinking Fund: $3,247, city places $1,125 in the fund each year. Expenses, $5,344: Operating, $2,809; int., $2,052; commissions, $483. Revenue, $4,873. An additional tax of ¼% is levied on acct. of water-works bonds, sinking fund and to cover any deficit. MANAGEMENT.—Supt. and Ch. Pump. Engr., Wm. Wheeler. Rept. by Chn., C. R. Alden, Sept. 21, '96. SEWERS.—None. REFERENCES.—Stand-pipe failure, Oct. 6, '88; Apr. 12, '94, illus.

D 18, 81. **WACO**, McLennan Co. (14,445.)

WACO WATER & LIGHT CO.

Built in '78 by Waco Water Co.; transferred to Waco Water & Power Co. about '90, and to present Co. about '91. Receiver was appointed in Mar., '95. In Mar., '96, property was sold under foreclosure suit on $416,000 mortgage, and accrued int.; bought for $85,000 by Wm. B. Hord, 44 Wall St., N. Y. City, representing a reorganization committee (press rept.). Co. furnishes only domestic supply. Supply, artesian wells, pumping to reservoir. Pumps, cap., 3,500,000 galls.; 1,500,000 Worthington comp. non-cond. and 2,000,000 Deane comp. dup. Reservoir, cap., 10,000,000 galls.; distributing; 135 ft. above city hall. Mains, 23 miles; cost extensions met by Co. Taps, 1,089; made by Co. at $2.50, $3, and $4, for ½, ¾ and 1-in. Services, galv. i.; paid for by consumer. Meters: Owned by consumer; controlled and repaired by Co. Use of meters optional with consumer; compulsory for R. Rs. and steam plants. Hydrants, public, 0. Consumption, (galls.) av., 786,240. Pressure, ordinary, 50 lbs. Cap. Stock: paid-up (in '90), $500,000. Bonded debt (in '90), $300,000 at 6%. Ch. Pump. Engr., C. A. Montgomery. Rept. by Supt. W. H. Gaines, Aug. 14, '96.

BELL WATER CO.

Built in '89. FRANCHISE.—15 yrs. from '89. Rates are fixed in contract with city. Co. is not exempt from local taxes. SUPPLY.—Ten artesian wells, pumping to stand-pipes. First five wells are each 1,842 ft. deep. New well being sunk. PUMPS.—Cap., 2,000,000 galls.; Deane comp. dup. A 3,000,000-gall. Worthington 6-cylinder triple exp. pump was to be delivered Feb., '97. Slack run of mine coal used; av. cost, $3.25 per short ton. RESERVOIR.—Cap., 150,000 galls.; underground, to receive surplus from wells; rept. by Co. in Jan., '97, as nearing completion. STAND-PIPES.—Cap., 394,000 galls. Two, iron; one of 188,000 galls., 20 × 80 ft.; other 206,000 galls., 20 × 88 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 45 miles; cost extension met by income. Taps, 3,500; made by Co. at $2.50 to $4 for ½ to 1-in. Services, w. i.; paid for by consumer. Meters: 8; owned and repaired by consumer; controlled by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 215. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 45 lbs.; fire, 70 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $200,000. Cap. Stock: Common, authorized, $250,000; all paid-up. No bonded debt. MANAGEMENT.—Prest., J. D. Bell; Rept. by Secy., E. S. McKenney, July 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 29, '82.

82. **WAELDER**, Gonzales Co. (388.) Under construction in '96 by Owens & Martin; to be completed by Nov. SUPPLY.—Artesian wells, pumping to stand-pipe. FINANCIAL.—Cost, "not exceeding $50,000." MANAGEMENT.—Address Ben Owen. Rept. by T. H. Trippe, June 11, '96.

83. **WAXAHACHIE**, Ellis Co. (3,076.) Built in '91 by Waxahachie Improvement & Water Co. FRANCHISE.—25 yrs. SUPPLY.—Artesian well, pumping to stand-pipe. PUMP.—Cap., 220,000 galls.; deep well from American Well Works Co. Calvert (Tex.) lignite used; av. cost, $1.75 per short ton, delivered. STAND-PIPE.—Cap., 100,000 galls.; steel, on elevated ground. DISTRIBUTION.—Mains, 4 miles; cost extensions met by bonds. Taps, 120; made by city for $4. Services, galv. i.; paid for by consumer. Meters: 42; owned by city or consumer; controlled and repaired by city. City can compel use of meters and any consumer may have one. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 43 lbs. Steam fire engines are used. FINANCIAL.—Cost, $12,000. Expenses, Operating, $2,000. Revenue, $275: Consumers, unmetered, $100; metered, $75. MANAGEMENT.—Secy., S. W. Spencer; Treas., Wm. Hipp; Ch. Pump. Engr., W. D. Derr. Rept. by Prest. and Supt., E. A. Du Bose, July 9, '96. PROJECTED IMPROVEMENTS.—Now sinking an additional artesian well and will put in reservoir. Also 1,000,000-gall. air-lift and direct pressure pump. SEWERS.—Are to be constructed soon.

84. **WEATHERFORD**, Parker Co. (3,369.) Mortgage foreclosed and works now owned by City of Weatherford Water, Light & Ice Co., which took charge in Aug., '95; built in '88 by Weatherford Water, Light & Ice Co. FRANCHISE.—50 yrs. from '95; does not provide for purchase of works by city. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $2,250 per yr. for public service. Contract for three years from Feb., '96. No legal difficulties. SUPPLY.—Three artesian wells, 450 ft. deep, and one surface well with dy. supply of 30,000 galls.; total supply, 250,000 galls., pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Deane, comp. dup. Screened lump coal used; av. cost, $3 per short ton, and wood $2 per cord; a mixture of each is used. RESERVOIR.—Cap., 1,100,000 galls.; storage, located on hill 90 ft. above public square. DISTRIBUTION.—Mains, 4 miles; cost extensions met by

income. Taps, 107; made by Co. for $5, including service to sidewalk. Services, galv. ¾.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 30. PRESSURE.—Ordinary, 42 lbs.; fire, 65 lbs. One steam fire engine is owned by city, but not used. FINANCIAL.—Cap. Stock, common, authorized, $80,000. Bonded debt, $80,000 at 5%. Revenue, City, fire protection, $2,250. MANAGEMENT.—Prest., Jas. B. Rathbone; Secy., Platt V. Bryan, both of Elmira, N. Y. Rept. by Supt., Henry Warren, June 12, '96. SEWERS.—None.

F 6. **WEIMAR,** Colorado Co. (1,443.) Built in '96 by city; put in operation in April. Engr. and Contr., B. F. Round, Chattanooga, Tenn. Supply, surface well, pumping to tank. Wood used as fuel. Stand-pipe, cap., 99,000 galls.; 13 × 100 ft. Mains, 4,000 ft. Hydrants, public, 8; private, 2. One steam fire engine. Cost, $6,000. No sewers. Rept. in '96.

85. **WEST,** McLennan Co. (Not given.) Built in '94 by West Water, Power & Light Co. FRANCHISE.—None. No legal difficulties. SUPPLY.—Artesian well, direct to mains. FILTERS.—Cap., 250,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps made for $5. Services, galv. ¾.; paid for by consumer. Meters, 0. Hydrants, public, 8. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $10,500. Cap. Stock, $25,000; paid-up, $8,200. Floating debt, $1,000; no bonds. Expenses: Operating, $30. MANAGEMENT.—Prest., Z. Davis; Vice-Prest., W. W. Glasgow; Treas., T. M. West. Rept. by Secy. and Supt., H. H. Ingraham, June 18, '96. SEWERS.—None.

D 19. **WHARTON,** Wharton Co. (Est., 1,239.) Owned by Mrs. T. C. Klein; built in '93; put in operation in May. Works were to have been owned by C. Underhill, Engr. and Contr. for plant; were taken by Mrs. Klein to protect her interests. Town is unincorporated, but it is expected that satisfactory charter will be secured from next legislature, after which contract will be made for fire and other public service. No legal difficulties. Supply, river, and well, in case former is muddy, pumping to stand-pipe and direct. Pumps, cap., 1,150,000 galls.; 2—575,000 Blake. Tanks, cap., 80,000 galls.; 2—40,000; elevated. Mains, 2½ miles. Taps, 120. Services paid for by consumer. Meters, 0. Hydrants, private, 4. Pressure, 40 to 150 lbs. Cost, $8,000. Floating debt, $1,000 at 10%. Expenses: Operating, $1,200. Rept. by H. Klein, Mgr.

P 19. **WHITNEY,** Hill Co. (Est., 897.) Whitney Water & Light Co. was incorp. in '96, with authorized cap. stock of $5,000. Aug. 31, '96, W. T. Herrick, Com. on Bids, rept. that Co. was ready for bids on mains and hydrants.

86. **YOAKUM,** De Witt Co. (767.) Built in '92 by Yoakum Improvement Co.; put in operation in March. FRANCHISE.—50 yrs. from '92. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $50 per year. per hydrant and $12 each for three watering troughs. No legal difficulties. SUPPLY.—Artesian wells, pumping to reservoir, thence repumping to stand-pipe or direct. PUMP.—Cap., 750,000 galls.; Smith-Vaile dup.; also air-lift for pumping from wells to reservoir. Lignite used; av. cost, $1.35 per short ton. STAND-PIPE.—Cap., 100,000 galls.; iron; 35 × 105 ft. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 10 miles. Taps, 400; made by Co. for $10. Services, ½ and ¾-in. galv. ¾.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 55; private, 10. CONSUMPTION.—(Galls.) av., 250,000; max., 400,000; min., 90,000. PRESSURE.—Ordinary, 48 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $87,000. Cap. Stock: authorized, $100,000; paid-up, $66,000. No debt. MANAGEMENT.—Prest., W. C. Robards, San Antonio; Treas., E. B. Carruth. Rept. by Secy. and Supt., J. W. Greer, Nov. 21, '96. SEWERS.—None.

OKLAHOMA.

—? **CHANDLER,** Lincoln Co. (Est., 1,140.) First supplied about '94 by city. Plant was a failure, owing to insufficient supply and leaky mains. New works are now under construction by city. SUPPLY.—(New.) Well, on bank of creek, pumping to tank. Wood used; av. cost, $1.50 per cord. TANK.—Cap., 26,000 galls.; 15 × 20 ft. FINANCIAL.—Cost of original plant, $6,000. City proposes to repudiate the bonds if possible. MANAGEMENT.—Rept. by Prest. of Council, M. D. Tenney, Jan. 15, '97.

1. **EL RENO,** Canadian Co. (285.) Built by —— McCormick; transferred to J. B. Brown & Co. Aug. 15, '96. SUPPLY.—Driven wells, pumping to stand-pipe. PUMPS.—Cap., 1,000,000 galls.; Smith-Vaile and Fairbanks-Morse. McAllister coal used; av. cost, $3 per short ton. STAND-PIPE.—Cap., 130,000 galls.; steel; 12 × 154 ft. FISCAL YEAR CLOSED Aug. 8. DISTRIBUTION.—Mains, 6½ miles. Taps, 350; made by Co. Services, galv. ¾.; paid for by consumer. Meters, 25; owned by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 1,250,000. PRESSURE.—Ordinary and fire, 75 lbs. MANAGEMENT.—Prest., J. R. Brown, Parson, Kan.; Ch. Pump. Engr., Earl Gainer. Rept. by Supt. T. D. Gainer, Aug. 31, '96. PROJECTED IMPROVEMENTS.—Extensive changes in machinery. SEWERS.—None

2. **GUTHRIE,** Logan Co. (2,788.) Built in '93 by city; put in operation in May.

Contr., E. Sykes, Minneapolis, Minn. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMP.—Cap., 1,440,000 (makers rept. 2,460,000) galls.; Deane dup. Wood used; av. cost, $2 per cord. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. DISTRIBUTION.—Mains, 8½ miles; cost extensions met by revenue. Taps, 347; made by city at $6.10 for ½-in.; $7.37 for ¾-in. and $9.11 for 1-in. Services, galv. i.; paid for by consumer. Meters: 5; owned by consumer; controlled and repaired by city. Use of meters compulsory for barbers and manufacturers. City can compel use of meters and any consumer may have one. Hydrants, public, 57. CONSUMPTION.—(Galls.) av., 100,000; max., 150,000; min., 50,000. PRESSURE.—Ordinary, 65 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $65,000. Debt, $52,000: Floating, $2,000; Bonded, $50,000 at 7%; due in 1913. Sinking Fund, none. Expenses, $5,100; Operating, $2,600; int., $3,500. Revenue, $7,300: Consumers, unmetered, $3,200; metered, $50; City, fire protection, $2,850; street sprinkling, $1,200. MANAGEMENT.—Water Comrs., H. C. Barney. Rept. by Cy. Clk., Geo. M. DeGroff, July 6, '96. SEWERS.—None.

3. **KINGFISHER,** Kingfisher Co. (1,134.) Built in '92 by city. Engr., Geo. C. Boland; Contrs., Caldwell & Conley. SUPPLY.—Uncle John's Creek, "with brick tunnel and filters" (probably filter gallery), pumping direct. PUMPS.—Cap., 1,000,000 galls.; Nordberg. Bituminous coal used; av. cost, $4 per short ton. FILTERS.—Brick tunnel. DISTRIBUTION.—Mains, 3 miles; cost extensions met by bonds. Meters: 2; owned and controlled by consumer. Use of meters compulsory for Pabst Ice Co. City can compel use of meters and any consumer may have one. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $20,000. Expenses, Operating, about $300. MANAGEMENT.—Rept. by Supt., Geo. C. Boland, Dec. 24, '96. SEWERS.—No sanitary sewers.

4. **NORMAN,** Cleveland Co. (787.) Built in '94 by city. SUPPLY.—Pumping to stand-pipe. MANAGEMENT.—Rept. by Clk., J. R. Pyles, July 27, '96.

5. **OKLAHOMA CITY,** Oklahoma Co. (4,151.) Owned by H. G. Thomas; built in '92 by D. H. Scott; put in operation Jan. 1, '93. Engrs., D. H. Scott and L. H. Cooke. FRANCHISE.—20 yrs. from '92; provides for purchase of works by city after 10 yrs. Rates are fixed in franchise. No legal difficulties. SUPPLY.—18 3-in. driven wells, one 20-in. well, and river, pumping direct. PUMPS.—Cap, 2,000,000 galls.; two Knowles. Bituminous nut and pea coal used; av. cost, $3.55 per short ton. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 9⅝ miles. Taps, 469; made by Co. at $9 for ½-in. and $10 for ¾-in. Services, galv. i.; paid for by consumer. Meters, 7; owned, controlled and repaired by Co. Use of meters compulsory for manufacturers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 95. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. MANAGEMENT.—Prest. and Treas., H. G. Thomas. Rept. by Secy. and Supt., D. A. Johnston, Dec. 13, '96. SEWERS.—Has sanitary sewers.

6. **PERRY,** Noble Co. (Est., 5,750.) Built in '95 by Perry Water & Light Co.; put in operation in July. Engrs. and Contrs., Howe Pump & Engine Co., Indianapolis, Ind. FRANCHISE.—20 yrs. from '95; provides for purchase of works by city in 10 yrs. Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $55 per yr. No legal difficulties. SUPPLY.—Wells, pumping to storage reservoir and direct. PUMPS.—Cap., 500,000 galls.; Laidlaw-Dunn-Gordon (cap. rept. by makers). RESERVOIR.—Cap., 1,000,000 galls.; storage. PRESSURE.—Ordinary, 50 lbs.; fire, 120 lbs. FINANCIAL.—Cap. Stock, including water, light and ice plant, authorized, $150,000; all paid-up. Revenue: City, fire protection, $2,200. MANAGEMENT.—Prest., W. E. Caldwell, Louisville, Ky.; Secy., S. E. Gaylord, Indianapolis, Ind.; Treas., W. E. McKinstry. Rept. by Supt., E. D. Nims, Jan. 11, '97.

P 1. **SHAWNEE,** Pottawatomie Co. (Est., 425.) Works have been projected for some time. Franchise of Shawnee Industrial Co. expired in July, '96. Dec., '96, there was talk of city building works in '96 at cost of $10,000; also of private ownership. Supply, springs, one mile distant, probably pumping to stand-pipe.

COLORADO.

1. **AKRON,** Washington Co. (559.) Built in '90-1 by town. SUPPLY.—Wells, pumping to stand-pipe and direct. PUMP.—Deane. Av. cost of coal used, $3.10 per short ton. STAND-PIPE.—Cap., 86,000 galls.; 14 × 75 ft., of ⅛ to 3-16-in. plates. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 3 miles. Taps, 46; made by city. Services, ¾-in.; paid for by consumer. Meters: 3; owned by city. Use of meters not optional with consumer. Hydrants, public, 12. PRESSURE.—Ordinary, 35 lbs.; fire, 125 lbs. FINANCIAL.—Debt, $26,500: Floating, $1,500, at 8%; Bonded, $25,000; due in 1905. Expenses, Operating, $600. Deficits are fully met by general taxation. MANAGEMENT.—Rept. by C. N. Yeomans, Mem. of Town Bd., Sept. 22, '96. SEWERS.—None.

—? **ALTMAN,** El Paso Co. (Not given.) Two separate plants built in '96 by J. A. Brod & Son and Gilpatrick & Co., respectively, each pumping water to a tank. These

were probably very small plants, doubtless for domestic supply, for press rept., Feb. 7, '97, stated a 15-yr. franchise had been granted to Wm. R. Kilpatrick.

—? **ANTONITO,** Conejos Co. (315.) First supplied from irrigating ditches of Taos Valley Co. In '91 supply was introduced by town from river. At time of making report an artesian well was being sunk experimentally. Rept. by E. H. McConnell, Town Clk. Press rept., Feb. '97, stated works were being discussed.

2. **ASPEN,** Pitkin Co. (5,108.) Built in '86 by Castle Creek Water Co. In '96 Castle Creek Water Co. of W. Va. bought out above Co., and also the Midland Water & Power Co. FRANCHISE.—20 yrs. from '86; provides for purchase of works by city in 10 yrs. Co. is not exempt from lacol taxes. City to pay $75 per yr. for first 30 hydrants and $50 for each additional one. LEGAL DIFFICULTIES.—"Are trying to cut down number of hydrants; not settled." SUPPLY.—(In '90.) Castle and Hunter Creeks, by gravity. TANK.—Cap., 20,000 galls. DISTRIBUTION.—Hydrants, public, 56; private, 10. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cap. Stock: authorized, $100,000; all paid-up. Bonded debt, $50,000 at 8%. MANAGEMENT.—Prest., D. R. C. Brown; Secy., J. M. Downing; Treas., J. H. Devereux. Rept. by Supt., Harry G. Koch, in '96.

20. **BARNUM AND VILLA PARK,** Arapahoe Co. (Not given.) See Denver.

3. **BERTHOUD,** Larimer Co. (228.) Bought by town in '89; built in '86 by Berthoud Ditch, Reservoir & Water Co. SUPPLY.—Impounding reservoir, 50 acres area, by gravity. RESERVOIR.—Distributing; 125 × 300 ft. DISTRIBUTION.—Mains (in '88), 3 miles. Hydrants, 5. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost (in '88), $12,000. Expenses, $150. Revenue, $1,200. NOTE.—No rept. since '90-1 Manual.

4. **BLACK HAWK,** Gilpin Co. (1,067.) Built in '83-4 by town. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 100,000 galls.; 300 ft. above town. DISTRIBUTION.—Mains, 4½ miles; cost extensions met by city funds. Taps, made by city, free. Services, galv. i.; paid for by property owner. Meters: 1; owned, controlled and repaired by city. Use of meters compulsory for electric light plant. City can compel use of meters and any consumer may have one. Hydrants, public, 15. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Bonded debt, $7,500, at 8%; due in 1900. Deficits met by general taxation; last year tax was 2 mills for int. and 2½ mills for sinking fund. MANAGEMENT.—Rept. by Cy. Marshal, Wm. R. Backus, June 19, '96. SEWERS.—None.

5. **BOULDER,** Boulder Co. (3,330.) Built in '75 and extended in '90 by town. SUPPLY.—Boulder Creek, four miles up the canyon, by gravity to and from storage reservoir. RESERVOIR.—Cap., 6,000,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 25 miles; cost extensions met by revenue. Taps, 1,000; made by city at $1 for tap and cost of fixtures. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 90. PRESSURE.—Ordinary, 100 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $177,500. Bonded debt, $130,000: $80,000, at 5%; due in 1904; $50,000, at 6%; due in 1904 and 1908. Sinking Fund, none. Expenses, $8,200: Operating, $1,200; int., $7,000. Revenue: Consumers, $11,214. MANAGEMENT.—Supt., W. W. Wells. Rept. by Cy. Clk., E. K. Stafford, June 5, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, May 13, '82.

6. **BRECKINRIDGE,** Summit Co. (Est. 700.) Built in '86 by city. SUPPLY.—Small stream, by gravity to reservoir. RESERVOIR.—Is 28 × 100 ft. DISTRIBUTION.—Mains, 5,500 ft. Hydrants, 35. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $8,000. Bonded debt, $8,000, at 8%. NOTE.—No rept. since '90-1 Manual.

7. **BRIGHTON,** Arapahoe Co. (306.) Owned by A. Skeel; built in or since '90. SUPPLY.—Well, pumping to stand-pipe. FINANCIAL.—Cost, $8,000. MANAGEMENT.—Address owner. Engr., D. F. Carmichael. Rept. by L. I. Long, Oct. 20, '96.

8. **BUENA VISTA,** Chaffee Co. (Est., 1,500.) Built in '83 by town. SUPPLY.—Cottonwood Creek, by gravity. RESERVOIRS.—Cap., 39,000 galls.; 28,000 and 11,000. FISCAL YEAR CLOSED Dec. 1, '96. DISTRIBUTION.—Mains, 6 miles; cost extensions met by appropriations of town council. Taps, 175; made by town. Services, iron; paid for by consumer. Use of meters optional with consumer. Hydrants, public, 16; private, 3. CONSUMPTION.—(Galls.) av., 500,000; max., 750,000; min., 300,000. PRESSURE.—Ordinary, 45 lbs.; fire, 67½ lbs. FINANCIAL.—Cost, $38,000. Bonded debt, $30,000, at 8%; due in 1903. Expenses: Operating, $600. Revenue: Consumers, unmetered, $1,500. MANAGEMENT.—Mayor, A. E. Wright; Clk., D. M. Jones. Rept. by Supt., H. M. Kemble, July 1, '96. PROJECTED IMPROVEMENTS.—Reservoir, with seepage supply. SEWERS.—None. REFERENCE.—Eng. News, Dec. 29, '83.

9. **CANON CITY,** Fremont Co. (2,825.) Owned by city; built in '80 by Canon City Water Co. SUPPLY.—River, pumping direct. PUMPS.—Cap., 3,000,000 galls.; Lannon (Pueblo, Colo.), water-power. FILTERS.—Blind ditch, from river to pump well. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 6 miles; cost extensions met by revenue. Taps, about 400; made by city at $7 for ¾-in. Services, w. i.; paid for by property owner. Meters, 0. Use of meters optional with city. Hydrants, public, 31. CONSUMPTION.—(Galls.) av., 476,903; max., 542,252; min., 388,260. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $80,000. Bonded debt, $70,000: $60,000, at 6%; due in 1926; $10,000, at 6%; due in 1909. Sinking Fund, none. Expenses, $7,087: Operating, $2,887; int., $4,200. Revenue, $14,369: Consumers, $9,713;

other purposes, $4,656. MANAGEMENT.—Mayor, S. S. Nichols; Clk., Ed. Minor; City Engr., W. H. Burrage. Rept. by Supt., Allen Jameson, July 15, '96. SEWERS.—Has partial sanitary sewers. REFERENCE.—Eng. News, July 15, '82.

10. **CARIBOU**, Boulder Co. (Not given.) Built in '78 by city. SUPPLY.—Ditch, by gravity from reservoir. Ditch is 1½ miles long, and is fed by springs and melting snow. RESERVOIR.—Cap., 35,000 galls.; 20 × 20 ft., × 12 ft. deep. DISTRIBUTION.—In '89 there were 1,400 ft. of mains, 15 water-takers, and five fire hydrants. MANAGEMENT.—Rept. by Mayor, J. W. Irwin, Sept. 23, '96, who wrote: "The water system here is just about the same as in '78; there have been no water rates collected in that time; the town is almost deserted as a result of the low price of silver."

11. **CASCADE**, El Paso Co. (Est., 600.) Built in '87 by Cascade Town & Improvement Co., which has been succeeded by Cascade Town Co. SUPPLY.—Cascade Creek, by gravity from reservoir. DISTRIBUTION.—(In '90.) Mains, 3 miles. Taps, 22. Meters, 0. Hydrants, public, 7. FINANCIAL.—Cost, $10,000. No debt. MANAGEMENT.—Secy. and Treas., W. W. Miller; rept. by Prest. and Supt., D. N. Heizer.

12. **CASTLE ROCK**, Douglas Co. (315.) Built in '90 by town. SUPPLY.—Creek, by gravity. RESERVOIR.—On hill above town. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains; cost extensions met by town. Taps made by town, free. Services, iron; paid for by town. Hydrants, public, 15. FINANCIAL.—Cost, $8,000. Bonded debt, $8,000, at 8%; due 1907. Sinking Fund: $2,000, $1,500 invested in first mortgage real estate at 8%. Expenses: Operating, $100. Deficits are met entirely by taxation. MANAGEMENT.—Rept. by Frank D. Ball, June 11, '96. SEWERS.—None.

13. **CENTRAL CITY**, Gilpin Co. (2,480.) First supplied in '78 by Wilson Bros.; present works built in '86-9 by city. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 600,000 galls. DISTRIBUTION.—Mains, 25 miles; cost extensions met by city bonds. Taps, 400; made by city, free. Services, iron; paid for by city to street line. Meters, 20; owned, controlled, and repaired by city. Use of meters compulsory where necessary. City can compel use of meters and any consumer may have one. Hydrants, public, 42; private, 8. CONSUMPTION.—(Galls.) max., 216,000; min., 43,200. PRESSURE.—Ordinary, 165 lbs.; fire, 300 lbs. FINANCIAL.—Cost, $100,000. MANAGEMENT.—Rept. by Water Comr., R. C. Johnson, June 27, '96. SEWERS.—Has partial sanitary sewers.

14. **COAL CREEK**, Fremont Co. (Est., 600.) Built in '92 by Coal Creek Water & Light Co. FRANCHISE.—5 yrs. from '92 (will be renewed). Co. is exempt from local taxes. City to pay $135 per yr. for public service. No legal difficulties. SUPPLY.—Mountain streams, by gravity. RESERVOIR.—Cap., 2,000,000 (?) galls.; 300 ft. above town. DISTRIBUTION.—Mains; cost extensions met by Co. Taps, 150; made by Co. at cost. Services, ½ in.; paid for by property owner. Meters, 2; owned by Co. Use of meters optional with consumer; coal co. is supplied through meter. Hydrants, public, 11. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $50,000; paid-up, $12,000. Floating debt, $2,600, at 10%. MANAGEMENT.—Secy. and Treas., Geo. Wilson; rept. by Prest., A. F. Alexander, Jan. 12, '97. SEWERS.—None.

15. **COLORADO CITY**, El Paso Co. (1,788.) Built in '88 by Colorado City Water Co. SUPPLY.—Sutheriand Creek, by gravity to and from reservoir. RESERVOIR.—Cap., 8,000,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 150. Meters, 0. Hydrants, 24. PRESSURE.—Ordinary, and fire, 120 lbs. FINANCIAL.—Cost, $30,000. Cap. Stock, $20,000. No debt. Revenue: Consumers, $1,500; city, none. NOTE.—No rept. since '90-1 Manual.

16. **COLORADO SPRINGS**, El Paso Co. (11,140.) Built in '79 by city. SUPPLY.—Impounding reservoirs on Pikes Peak, by gravity. A tunnel 6,242 ft. long, at an elev. of about 11,500 ft. above sea level, diverts water from western to eastern slope of Pike's Peak. RESERVOIRS.—Cap., 1,200,000,000 galls., including four completed and two under construction. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 72 miles; cost of extensions met by water rents. Taps, 5,000; made by city for $7.35. Services, galv. i. and lead; paid for by consumer. Use of meters optional with city. Hydrants, public, 135. CONSUMPTION.—(Galls.) av., 5,000,000. PRESSURE.—Ordinary, and fire, 90 lbs. FINANCIAL.—(In '94.) Bonded debt, $460,000: $265,000 at 6%, due 1901 to 1905; $70,000 at 6%, due 1906; $100,000 at 5%, due 1905 and 1906; and $25,000 at 7%, due '96. Expenses, $31,692: Operating, $4,842; int., $26,850. Revenue: Consumers, $39,320. MANAGEMENT.—Chn. of Com., H. C. McCreeny; Secy., Moses T. Hale; rept. by Supt., E. W. Frost, June 25, '96. SEWERS.—Has sanitary sewers. REFERENCES.—Eng. News, Dec. 9, '82; tunnel and history of development, Aug. 27, '96, illus. and inset.

17. **CRESTED BUTTE**, Gunnison Co. (857.) Built in '89 by Crested Butte Light & Water Co. SUPPLY.—Coal Creek, by gravity, to reservoir. RESERVOIR.—Cap., 2,000,000 galls.; 200 ft. above town. DISTRIBUTION.—Mains, 3.5 miles. Taps, 27. Hydrants, 112. FINANCIAL.—Cost, $35,000. Expenses, $2,600. Revenue, $6,600. NOTE.—No rept. since '90-1 Manual.

18. **CRIPPLE CREEK**, El Paso Co. (Not given.) Built in '93 by Michigan Pipe Co., Bay City. Engr., S. V. Saleno, Bay City, Mich. FRANCHISE.—20 yrs. from '91.

Co. is exempt from local taxes. No legal difficulties. SUPPLY.—Beaver Creek, by gravity. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, 12 miles. Taps, 300; made by Co. for $3. Services, iron; paid for by consumer. Meters, owned and controlled by Co. Co. can compel the use of meters and any consumer may have one. Hydrants, public, 80. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $100,000; all paid-up. MANAGEMENT.—Secy. and Treas., H. B. Smith. Rept. by Prest., S. V. Saleno, Bay City, Mich., June 26, '96. SEWERS.—Has sanitary sewers.

19. **DEL NORTE,** Rio Grande Co. (736.) Built in '92 by town; put in operation in Oct. Engr., Geo. D. Nickel. SUPPLY.—Rio Grande River, pumping through distributing mains to reservoir. PUMPS.—Cap., 600,000 galls.; Knowles power; light and water plants are run by 75-HP. Reynolds-Corliss engines. Durango slack used; av. cost, $3.10 per short ton, delivered. RESERVOIR.—Cap., 287,000 galls.; 5,800 ft. from pumping station. FISCAL YEAR CLOSED April 1, '96. DISTRIBUTION.—Mains, 3.6 miles; cost extensions met by town. Taps, 70; made by town, charged to consumer at cost. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 75,000; max., 80,000. PRESSURE.—Ordinary, 100 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $27,000. Bonded debt, $30,000, at 6%; due in 1906. No Sinking Fund. MANAGEMENT.—Mayor, Rept. by Geo. D. Nickel, Engr., Jan. 16,'97.

20. **DENVER,** Arapahoe Co. (106,713 + 1,491, South Denver, annexed since '90.) After various changes and consolidations works are now owned by Denver Union Water Co. First supplied in '71 or '72 by Denver Water Co., which in '90 consolidated with Beaver Brook and Mountain Water Cos., as Denver City Water Co. In '91, competing works were put in operation by Citizens' Water Co., paralleling mains of other Co. After a bitter rate war the two Cos. consolidated in '94 as Denver Union Water Co. The Denver City Water Co. supplied a number of suburbs in '91 through works or extensions made by some one of the three Cos. consolidated to form it. These places were as follows: Barnum and Villa Park, Elyria, Harman, Highlands, Montclair and North Denver. Highlands was first supplied in '87 by the Beaver Brook Water Co.; Barnum and Villa Park in '89, by the Mountain Water Co.; Elyria in '91, by the Denver City Water Co. South Denver, which built municipal works in '89, has been consolidated with Denver since '90; its works were leased by the Denver Union Water Co. in '94, at 6% of the then appraised valuation of the plant. The Denver City Water Co. became, or was controlled by, the American Water-Works Co., some time after '90. The present Co. sells water to Globeville, which see.

SUPPLY.—Platte River and Cherry Creek, by gravity and pumping to reservoir and tanks. SUPPLY CONDUIT.—Wood, 30 and 36-in., 20 miles long, from river to city. PUMPS.—Cap., 27,000,000 galls.: 2—6,000,000 Holly-Gaskill hor. high duty; 4,000,000 hor. dup. and 2,000,000 quarter crank Holly; 5,000,000 and 2—2,000,000 Holly hor. water power; one Holly power engine. Av. cost of coal used, $2 per short ton. FILTERS.—Cap., 25,000,000 galls.; Allen, gravity. RESERVOIRS.—Cap., 2,570,000,000 galls. Distributing, 70,000,000 galls. Impounding, 2,500,000,000, at present, and will have a cap. of 5,000,000,000 when completed. TANKS.—Cap., 1,460,000 galls.; two 730,000 equalizing tanks; 50 × 50 ft. DISTRIBUTION.—Mains, 410 miles; cost extensions met by contract with city; one hydrant to every 400 ft. of mains. Taps, 24,000; made by Co. at $2 for ⅝-in., $4 for ¾-in., $5 for ¾-in. and $6 for 1-in. Services, lead; paid for by consumers. Meters: 225; owned, controlled and repaired by Co. Hydrants, public, 2,566. CONSUMPTION.—(Galls.) av., 35,000,000; max., 42,000,000; min., 25,000,000. Variation in consumption due to irrigation. PRESSURE.—Ordinary, and fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $10,000,000. MANAGEMENT.—Prest., W. S. Cheesman; Secy., W. P. Miller; Treas., D. H. Moffat; Mgr., Rich. D. Holmes. Rept. by Chf. Engr., C. P. Allen, June 17, '96. SEWERS.—Has sewers. REFERENCES.—Eng. News, Nov. 19, '81, Sept. 22, 29, '88; wells, conduit, stand-pipe, etc., Apr. 28, Sept. 22, 29, '88; submerged pipe under Platte River, Apr. 28, '92, illus.; arched pipe bridge, Aug. 31, '93, illus.; filter plant, Feb. 1, '94; illus.; notes on the supply, Feb. 25, '97, illus. (this article describes the works, and includes illustrations and description of proposed masonry dam, 211½ ft. high.)

21. **DURANGO,** La Plata Co. (2,726.) Built in '83-4 by town. SUPPLY.—Animas River, pumping to reservoir. PUMPS.—In '96, makers rept. 1,500,000-gall. Worthington comp. cond. in use here; in '89 there were rept. two Deane, with aggregate cap. of 500,000 galls. RESERVOIR.—Cap., 500,000 galls.; formed by dam; 350 ft. above pumps. FISCAL YEAR CLOSED Apr. 14. DISTRIBUTION.—Mains, 5.3 miles. Taps, 450. Meters, 4. Hydrants, public, 48. CONSUMPTION.—(Galls.) av., 600,000. FINANCIAL.—Cost, $115,000. Bonded debt, $115,000; $80,000 at 8%, $20,000 at 7%, $15,000 at 7%. Expenses, $15,874: Operating, $7,024; int., $8,850. Revenue, $16,181. MANAGEMENT.—Chn., F. A. Wingate. Rept. by Supt., M. M. Preston, Sept. 23, '96. REFERENCE.—Eng. News, July 26, '84.

—? **EAST COLFAX,** (P. O. Montclair), Arapahoe Co. (Not given.) SUPPLY—Subterranean wells and Sand Creek, by gravity, through 3 miles of wood pipe to reservoir. No rept. since '90-1 Manual.

20. **ELYRIA,** Arapahoe Co. (Not given.) See Denver.

22. **ERIE,** Weed Co. (662.) Built in '95 by city. Contrs., Mitchell Bros., Pueblo

(press rept.). SUPPLY.—Impounding reservoir, by gravity. MANAGEMENT.—Supt., J. L. Wilson. Rept. by E. H. Griffin, Dec., '96.

23. **FAIRPLAY,** Park Co. (801.) Built in '82 by village. SUPPLY.—Spring, by gravity to and from reservoir. RESERVOIR.—90 × 220 ft. at top, 50 × 150 ft. at bottom; 78 ft. above and 2,500 ft. from center of town. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 1.5 miles. Taps, 100. Meters, 0. Hydrants, public, 12. FINANCIAL.—Cost, $10,000. Bonded debt, $400 overdue. Expenses: Operating, $150. Revenue: Consumers, $450. MANAGEMENT.—Water Comr. & Town Marshall, Jos. W. Sykes. Rept. by Mayor, Chas. A. Wilkin, Sept. 23, '96. REFERENCE.—Eng. News, Jan. 31, '85.

—?, P 1. **FLORENCE,** Fremont Co. (Est., 239.) Built by Denver & Rio Grande R R. Co., which supplies town and citizens at its own rates, without regulation by city authorities. A Co. has been organized to build works, but as yet nothing has been done to improve present inadequate supply. Rept. by Jas. A. McCandless, June 12, '96. PROJECTED WORKS.—Bonds for works were voted by city Jan. 21. Rept. by Geo. Killion, Cy. Clk., Feb. 1, '97. Press rept. states amount voted was $75,000.

24. **FORT COLLINS,** Larimer Co. (2,011.) Built in '82-3 by city. SUPPLY.—Cache la Poudre River, by gravity to impounding reservoir; thence by pumping direct. PUMPS.—Cap., 1,500,000 galls.; 2—750,000 Holly hor. water power. Bituminous coal used; av. cost, $3 per short ton. FILTERS.—Cap., 75,000 galls. RESERVOIR.—Cap., 2,000,000 galls.; impounding. In '89-90 Manual a 3,000,000-gall. settling reservoir was included. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains; cost extensions met by "main extension warrants." Taps, 574. Services paid for by property owner. Hydrants, public, 50. PRESSURE.—Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—Debt, $111,000; Floating, $6,000 at 8%; Bonded, $105,000 at 5%; due in 1915. Sinking Fund, none. Expenses: Operating, $2,000. MANAGEMENT.—Rept. by Supt., Robert. S. Fedder, July 9, 96. REFERENCES.—Eng. News, May 17, '84; canal, Oct. 11, '94, illus.

25. **GEORGETOWN,** Clear Creek Co. (1,927.) Bought by city in '91; built in '74 by Clear Creek Water Co. SUPPLY.—Clear Creek, by gravity to and from reservoir. RESERVOIR.—Cap., 60,000 galls. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 4 miles; cost extensions met by water rents. Taps made by consumer, no fee. Services, iron and lead; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 28. PRESSURE.—Ordinary, 30 to 80 lbs.; fire, 100 to 150 lbs. FINANCIAL.—Cost, $36,145. Bonded debt, $3,000 at 7%; due in 1896; $2,000 at 7%; due in '97 to 1900, annually; $2,000 at 7%; due in 1901 to '04 annually; $3,000 at 7%; due in 1905 and '06. Sinking Fund: $1,677 surplus in hands of Town Treasurer. Expenses, $2,630: Operating, $880; int., $1,750. Revenue, $4,541: Consumers, unmetered, $3,091; City, fire protection, $1,450. No deficits. MANAGEMENT.—Chn., Wm. D. Arnold. Rept. by Cy. Clk. and Supt., Thos. B. Campbell, June 15, '96. SEWERS.—Has sanitary sewers only.

P 2. **GILLETT,** El Paso Co. (Not given.) Works have been proposed for some time. In '96, town first asked bids for building works, then granted franchise to L. D. Ross and Chas. A. Mackay, Cripple Creek. Dec., '96, nothing had been done under franchise. Feb. 2, '97, Saml. Vidler, Town Clerk, rept. election was proposed to vote bonds for works, and that Town Engr., G. H. Atherton, was making surveys.

51. **GLEN PARK** (P. O. Palmer), El Paso Co. Supply from Palmer Lake.

26. **GLENWOOD SPRINGS,** Garfield Co. (920.) Built in '88 by Glenwood Light & Water Co. SUPPLY.—No Name Creek, by gravity. DISTRIBUTION.—(In '90.) Mains, 6.3 miles. Taps, 182. Meters, 2. Hydrants, public, 21. CONSUMPTION.—(Galls.) av., 1,500,000. FINANCIAL.—Cost, $150,000. Cap. Stock: Authorized, $500,000; all paid-up. No debt. MANAGEMENT.—Prest., W. B. Devereux; Gen. Mgr., F. H. W. Lyle.

27. **GLOBEVILLE,** Arapahoe Co. (Not given.) Built in '95 by town; put in operation in Feb. Engr., C. P. Allen. SUPPLY.—From Denver Union Water Co. Rept. in '94 that price was 6 cts. per 1,000 galls. DISTRIBUTION.—Mains, 8 miles; cost extensions met by property owners. Taps, 70; made by town at 50 cts. for permit. Services, lead; paid for by property owner. Meters: 2; owned by property owner; controlled by town; repairs paid by property owner. Use of meters optional with consumer; compulsory for two tanneries. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—Ordinary, 85. FINANCIAL.—Cost, $26,000. Bonded debt, $26,000, at 6%. Expenses, $1,760: Operating, $200; int., $1,560. Rept. by S. F. Johnson, June 12, '96.

28. **GOLDEN,** Jefferson Co. (2,383.) Built in '79 by city. SUPPLY.—Infiltration from irrigating canal to two reservoirs, pumping direct. During '91, supply was increased by laying drain pipe 10 ft. underneath Clear Creek. PUMPS.—Cap., 1,500,000 galls.; Holly quadruplex. RESERVOIRS.—Two, each 150 × 12 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 185. Meters, 1. Hydrants, 40. FINANCIAL..—Cost, $49,000. Bonded debt, $49,000 at 8%, due in 1900. Expenses, $9,900: Operating, $4,500; int., $5,400. Revenue: Consumers, $4,734; City, none. NOTE.—No rept. since '90-1 Manual. REFERENCES.—Eng. News, Apr. 7, '83; increased supply, June 27, '91.

P 3. **GOLDFIELD,** El Paso Co. (Not given.) Press rept., Feb. 13, '97, stated

contract for works had been let to Eli Can; to be completed by June 1, '97; cost, not to exceed $30,000, including reservoir.

29. **GRAND JUNCTION,** Mesa Co. (2,030.) Built in '88-9 by Grand Junction Water Co. See note. FRANCHISE.—20 yrs. SUPPLY.—Grand River, pumping to stand-pipe. PUMPS.—(In '89.) Cap., 1,500,000 galls.; Knowles. STAND-PIPE.—(In '89.) Cap., 58,000 galls.; 10 x 100 ft. FISCAL YEAR CLOSED Aug. 7. DISTRIBUTION.—Mains, 4 miles. Taps, 300. Meters: 2. Hydrants, public, 55. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by D. Roberts, Mgr. and Supt., Oct. 3, '96, who stated there had been no change since '90-1 Manual. City had projected municipal works since '95, and has let contract once or twice. Press repts. early in '97 stated people would vote on buying and extending Co.'s works.

30. **GREELEY,** Weld Co. (2,395.) Built in '89 by city. SUPPLY.—Well and galleries, pumping to tank. PUMPS.—Cap., 3,000,000 galls.: 2,000,000 Laidlaw-Dunn-Gordon; 1,000,000 Holly hor. dup. Lignite used; av. cost, $2.75 per short ton. FILTER GALLERIES.—In '91 gallery 100 ft. long and 18 ft. deep was added. TANK.—Cap., 158,000 galls.; iron; 30 x 30 ft., on hill. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 11¾ miles; cost extensions met by appropriations from general revenue. Taps, 395; made by city. Services, lead; paid for by property owner. Meters: 10; owned, controlled and repaired by city. Use of meters compulsory for livery stables and motors. City can compel use of meters and any consumer may have one. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 600,000; max., 1,200,000; min., 300,000. PRESSURE.—Ordinary, 60 to 70 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $70,000. Bonded debt, $65,000, at 6%; due in 1906. Expenses, Operating, $4,000. Revenue, $5,500. MANAGEMENT.—Ch. Pump. Engr., F. S. Dresser. Rept. by Supt., M. P. Henderson, June 5, '96. PROJECTED IMPROVEMENTS.—New boiler ordered. SEWERS.—Has partial combined system of sanitary and storm sewers.

31. **GREEN MOUNTAIN FALLS,** (P. O. Green), **AND UTE PARK** (P. O. Cascade), El Paso Co. (Not given.) Built in '90 by Ute Pass Land & Water Co. SUPPLY.—South Fork of Fountain qui Bouille, by gravity. RESERVOIRS.—Cap., 160,000 galls.; settling. DISTRIBUTION.—Mains, 4.2 miles. Taps, 25. PRESSURE.—Ordinary, 90 lbs.; fire, 200 lbs. FINANCIAL.—Cost, $35,000. Expenses, $780. NOTE.—No rept. since '90-1 Manual.

32. **GUNNISON,** Gunnison Co. (1,105.) Built in '82 by Gunnison Gas & Water Co. FRANCHISE.—25 yrs. from '82. Provides for purchase of works by city 1907; price to be 10% added to actual value. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $37.50 per yr. each for first 31 hydrants. LEGAL DIFFICULTIES.—Town claimed that they were limited to 3-mill levy; compromised. SUPPLY.—Gunnison River, pumping to tank and direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington, non-cond., one a comp. Anthracite pea coal used; av. cost, $1.25 per short ton. TANK.—Cap., 60,000 galls.; wood, on stone foundation, 195 ft. above town. FISCAL YEAR CLOSED Sept. 1, '95. DISTRIBUTION.—Mains, 3 miles; cost extensions met by Co. Taps, 141; made by Co. for $3.50. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 165,463. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $86,259. Cap. Stock: Authorized, $200,000 for gas and water together. No debt. Expenses, Operating, $3,060. Revenue, $4,379: Consumers, unmetered, $1,604; City, fire protection, $2,775. No deficits. MANAGEMENT.—Prest and Treas., B. W. Lewis; Ch. Pump. Engr., C. H. Meyer. Rept. by Secy. and Supt., D. J. McCanne, June 6, '96. SEWERS.—None. REFERENCE.—Eng. News, Nov. 4, '82.

20. **HARMAN,** Arapahoe Co. (743.) See Denver.

20. **HIGHLANDS,** Arapahoe Co. (5,161.) See Denver.

33. **HOLYOKE,** Phillips Co. (649.) Built in '89 by Lincoln Land & Town Site Co. FRANCHISE.—Does not provide for purchase of works by city. SUPPLY.—Well, pumping to stand-pipe. Water is furnished by Burlington & Missouri Ry. Co. STAND-PIPE.—Cap., 64,000 galls.; 10 x 110 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5.5 miles. Taps, 107. Meters, 3. Hydrants, public, 16. CONSUMPTION.—(In '90.) (Galls.) av., 5,000. FINANCIAL.—Cost, $30,000. Expenses, nominal. MANAGEMENT.—Lincoln Land Co. Rept. by Supt., W. A. Powers, Sept. 23, '96.

34. **IDAHO SPRINGS,** Clear Creek Co. (1,338.) First supplied in '80 by city. Present works built in '95 by city. Engr., W. H. Wiley. Contrs, W. P. McCormick and Dungwall Bros. SUPPLY.—Soda Creek, flowing from impounding to distributing reservoir through wooden pipe laid on hydraulic grade. RESERVOIRS.—Cap., 1,500,000 galls.: Impounding, storage and settling reservoir, 500,000; distributing, 1,000,000. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by revenue. Taps, 290; made by city at $5, of which $2 is paid to Supt., who taps the mains. Services, iron; paid for by property owner. Meters, 0. Hydrants, public, 88. PRESSURE.—Ordinary, 100 to 125 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $20,000, at 6%; due in 1910. Expenses, $2,300: Operating, about, $1,110; int., $1,200. Rept. by V. I. Noxvie, July 21, '96. PROJECTED IMPROVEMENTS.—Work is under way to increase and purify supply. SEWERS.—Has sanitary sewers only.

35. **LAFAYETTE**, Boulder Co. (410.) Built about '93 by city for general use. Supply (pumping to ?) reservoir.

36. **LA JUNTA**, Otero Co. (1,489.) Bought by city in '93; built in '82-3 by A. T. & S. F. R. R. Co. and afterwards owned by La Junta Water Co. No legal difficulties. SUPPLY.—Large wells, pumping to tanks and direct. PUMPS.—Knowles and Smith-Valle. Steam is supplied by Ry. at $75 per month. TANKS.—Cap., 80,000 galls.; two 40,000 galls., wood, on trestles 16 ft. high. FISCAL YEAR CLOSED Jan. 30. DISTRIBUTION.—Mains, 3 miles; cost extensions met by water-works extension fund. Taps, 500; made by consumer for $4.50. Services, ¾-in.; paid for by property owner. City can compel use of meters and any consumer may have one. Hydrants, public, 16. CONSUMPTION.—Galls.) av., 200,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $38,000, at 6%. Expenses, $2,766: Operating, $480; int., $2,286. Revenue, $5,751. MANAGEMENT.—Prest., C. A. Beerbohm; Secy., J. G. Howard; Ch. Pump. Engr., J. C. Hornby. Rept. by Supt., E. P. Donahue, June 16, '96. SEWERS.—None.

37. **LAKE CITY**, Hinsdale Co. (607.) Built in '90 by town. SUPPLY.—Lake Fork of Gunnison River, by gravity from impounding reservoir. RESERVOIR.—2,000 ft. long, about one mile from town. DISTRIBUTION.—Mains, 3 miles. Hydrants, 17. FINANCIAL.—Cost, $25,000. Bonded debt, $25,000, at 8%; due in 1904. NOTE.—No rept. since '90-1 Manual.

38. **LAMAR**, Prowers Co. (566.) Bought by city in or prior to '89; built by Lamar Water Co. in '87. SUPPLY.—Artesian well, 560 ft. deep, pumping to tank and direct. PUMP.—Cap., 500,000 galls.; Knowles dup. TANK.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 130. Meters, 0. Hydrants, public, 26. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $22,000. Bonded debt, $22,000, at 6%. Expenses, $3,320: Operating, $2,000; int., $1,320. MANAGEMENT.—Rept. by Mayor, T. J. Holmes, Sept. 21, '96.

39. **LAS ANIMAS**, Bent Co. (611.) Built in '89 by city. SUPPLY.—Open well, pumping to tank and direct. Well is 20 × 25 ft., near river. PUMPS.—Cap., 1,100,000 galls.; two Deane comp. non-cond dup. TANK.—Cap., 90,000 galls.; 51 ft. high. DISTRIBUTION.—Mains, 3 miles. Taps, 100. Meters, 0. Hydrants, 30. PRESSURE.—(In '89.) Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $31,000. Bonded debt, $28,000, at 8%. Sinking Fund, $2,000. Expenses, $3,340: Operating, $1,100; int., $2,240. Revenue: Consumers, $500. NOTE.—No rept. since '90-1 Manual.

40. **LEADVILLE**, Lake Co. (10,384.) Built in '79 by Leadville Water Co. FRANCHISE.—20 yrs. from '79. Rates are subject to regulation by city jointly with Co. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Mountain stream, by gravity. RESERVOIRS.—Cap., 70,000,000 galls.; seven. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 30 miles. Taps made by Co., no fee. Services, galv. i. and lead; paid for by consumer. Meters: 5; owned by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 150; private, 5. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 100 lbs. FINANCIAL.—Cost, $700,000. Cap. Stock: Authorized, $400,000. Bonded debt, $300,000, at 6%. MANAGEMENT.—Prest., W. E. Hawks, Bennington, Vt.; Treas., W. W. Mason, Portland, Me. Rept. by Secy. and Supt., C. N. Priddy, Sept. 20, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Dec. 10, '81.

41. **LITTLETON**, Arapahoe Co. (Est., 289.) Built about '91 by Co. for general supply. No response to inquiry. Apr. 6, '97, people were to vote on buying out the Co.

42. **LONGMONT**, Boulder Co. (1,543.) Built in '82 by town. SUPPLY.—St. Vrain River and springs, by gravity to and from reservoir. Point of supply is 10 1-6 miles above reservoir in foot hills of Rocky Mts. RESERVOIR.—Cap., 665,000 galls.; storage, located 112 ft. above and one mile from town; roofed with corrugated iron. FILTER GALLERY.—(In '89.) 110 ft. long, 4 ft. wide, 2½ ft. high, 14 ft. below surface. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 22 miles; cost extensions met by revenue. Taps, 517; made for consumer at $2, fee by licensed plumber. Services, galv. i.; paid for by property owner. Meters: 12; owned, controlled and repaired by city. Use of meters compulsory for large consumers. Hydrants, public, 41; private, 1. CONSUMPTION.—(Galls.) av., 200,000; max., 250,000; min., 175,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $90,145. Bonded debt, $70,000, at 6%; due in 1916. Sinking Fund, none. Expenses, $5,105: Operating, $905; int., $4,200. Revenue, $7,807: Consumers, unmetered, $6,749; metered, $1,058. A 10-mill tax is required, in addition to revenue from other sources, to defray expenses. MANAGEMENT.—Mayor, Geo. W. Coffin. Rept. by Supt., Chas. L. Reed, June 5, '96. PROJECTED IMPROVEMENTS.—An additional 1,000,000-gall. reservoir; land purchased. SEWERS.—Has partial storm sewers only. REFERENCE.—Eng. News, Dec. 16, '82.

—? **LOUISVILLE**, Boulder Co. (596.) Built in '94 by city; completed in Dec. Cost, probably, about $30,000. No response to inquiries. In '91, city projected gravity supply from mountain streams; est., cost, $25,000. Works built rept. as costing $30,000.

43. **LOVELAND**, Larimer Co. (698.) Built in '87 by city. SUPPLY.—Litttle Canon of Big Thompson River, by gravity. DISTRIBUTION.—Mains, 12.5 miles. Taps, 167. Hydrants, 12. FINANCIAL.—Cost, $44,000. Bonded debt, $41,000. Expenses, $3,140: Op-

erating, $300; int., $2,840. Revenue, Consumers, $2,200. NOTE.—No rept. since '90-1 Manual.

44. **LYONS,** Boulder Co. (574.) Built in '91 by Michigan Pipe Co., of Bay City; put in operation in Oct. Engr., Geo. B. McFadden, Denver. FRANCHISE.—Provides for purchase of works by city in 20 yrs. Certain rates are fixed in franchise. City to pay int. on bonds. LEGAL DIFFICULTIES.—City refuses to pay int. SUPPLY.—St. Vrain Creek, by gravity through three miles of wooden pipe line. FISCAL YEAR CLOSED (about) Oct. 31. DISTRIBUTION.—Mains, 3 miles. Taps, 52; made by consumer, no fee to Co. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 13. PRESSURE.—Ordinary, 65 lbs.; fire, 50 lbs. FINANCIAL.—Bonded debt, $25,000. Expenses: Int., $1,500. MANAGEMENT.—Prest., J. R. Cunningham; Secy., E. B. Lollar; Treas., M. J. Scanlon. Rept. by L. C. Lyon, Jan. 13, '97. SEWERS.—None.

45. **MANITOU IRON SPRINGS** (P. O. Manitou), El Paso Co. (1,439.) Built in '87-8 by town. SUPPLY.—French Creek, fed by springs, by gravity to reservoirs through 10-in. and 6-in. parallel pipe-lines. RESERVOIRS.—Cap., 2,000,000 galls.; 2—1,000,000. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by town warrants. Taps, 300; made by town for $3.65. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 36; private, 1. PRESSURE.—Ordinary, 135 lbs. FINANCIAL.—Cost, $85,000. Bonded debt, $80,000, at 6%. Expenses: Operating, $700. Revenue, $5,000. MANAGEMENT.—Rept. by Supt., A. H. Coshow, July 10, '96. SEWERS.—Has sanitary sewers.

20. **MONTCLAIR,** Arapahoe Co. (880.) See Denver.

46. **MONTROSE,** Montrose Co. (1,830.) Built in '88 by town. SUPPLY.—River, pumping direct. PUMPS.—Cap., 1,750,000 (?) galls.: 750,000 Deane rept. in '89; makers rept. 1,000,000 Worthington comp. non-cond. DISTRIBUTION.—Mains, 5 miles. Taps (in 88), 98. Meters, 0. Hydrants (in '88), 11. FINANCIAL.—Cost, $25,000. Bonded debt, $20,000, at 6%; due in 20 yrs. Expenses, $4,200: Operating, $3,000; int., $1,200. Revenue: Consumers, $1,000. NOTE.—No rept. since '90-1 Manual.

47. **MORRISON,** Jefferson Co. (254.) Built in '85-6 by Morrison Water Co. FRANCHISE.—20 yrs.; does not provide for purchase of works by city. Rates are not subject to regulation by city. SUPPLY.—Bear Creek, by gravity. DISTRIBUTION.—Mains, ¾ miles. Taps, 25. FINANCIAL.—Cost, $3,500. Cap. Stock: Common, authorized, $5,000; paid-up, $3,500; paid 9¼% div'd in '91. Expenses, $19. Revenue, $348. NOTE.—No rept. since '90-1 Manual.

48. **NEW CASTLE,** Garfield Co. (311.) Built in '90 by town. SUPPLY.—East Fork of Elk Creek, by gravity through wooden flume 5½ miles long. DISTRIBUTION.—Mains, 4 miles. Taps, 34. Hydrants, 7. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $16,500. Bonded debt, $15,000 at 8%. Expenses, $1,700: Operating, $500; int., $1,200. Revenue, $2,700. NOTE.—No rept. since '90-1 Manual.

20. **NORTH DENVER** (No P. O.), Arapahoe Co. (Not given.) See Denver.

49. **ORDWAY,** Otero Co. (Precinct, 148.) Built in '90-1 by Ordway Water Co. Town is not incorporated yet. FRANCHISE.—Co. is exempt from local taxes. SUPPLY.—Reservoir, supplied by Colorado Canal. Artesian well was being sunk at time of rept. FILTER.—Brick laid in cement. RESERVOIR.—Cap., 1,300,000 galls.; 150 × 150, × 8 ft. deep. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by Co. Taps made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 4. CONSUMPTION.—Unknown. PRESSURE.—Fall of 40 ft. from reservoir. FINANCIAL.—Cost, about $3,000. Cap. Stock: Authorized, $10,000; paid-up, $3,500; paid no div'd in '95. No debt. No charge will be made for water until artesian well is finished. MANAGEMENT.—Prest., W. C. Roberts; Secy., Avery Moore. Rept. by F. A. Hodge, Prest., Colo. Land & Water Co., June 5, '96. PROJECTED IMPROVEMENTS.—An artesian well is being sunk; when completed a stand-pipe 40 ft. high will be added. SEWERS.—None.

50. **OURAY,** Ouray Co. (2,534.) Built in '81 by city. SUPPLY.—Spring, flowing to reservoir, thence by gravity. RESERVOIR.—Cap., 4,000,000 galls. DISTRIBUTION.—Mains, 28 miles; cost extensions met by revenue. Taps, 600; made by city for $5. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public 22; private, 8. CONSUMPTION.—(Galls.) av., 2,000,000. More water is used for irrigation and power than domestic use. PRESSURE.—Ordinary and fire, 140 lbs. FINANCIAL.—Cost, $50,000. Bonded debt, $38,000, at 7%. Sinking Fund, $4,000. Expenses: Operating, $2,000. Deficits will hereafter be met by general taxation; have not been heretofore. Rept. by B. H. Du Praw, Aug. 12, '96. PROJECTED IMPROVEMENTS.—A new 10,000-ft. supply main from springs to reservoir. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, June 27, '85.

51. **PALMER LAKE** (P. O. Palmer), El Paso Co. (Est., 94.) Built in '87 by Palmer Lake Water Co. FRANCHISE.—20 yrs. SUPPLY.—Monument Creek, by gravity. DISTRIBUTION.—Mains, 3 miles. Taps, 87. Meters, 0. Hydrants, 5. FINANCIAL.—Cost, $7,000. No debt. Expenses, $50. Revenue, $1,100: Consumers, $300; City, $800. NOTE.—No rept. since '89-90 Manual.

P 4. **PALISADES,** Mesa Co. (Not given.) Jan. 6, '97, J. H. Purton rept. C. C.

Bowers proposed to put in windmill, pump and tank to supply water for domestic use and to irrigate small piece of land. Town is not incorp.

52, 53. **PUEBLO,** Pueblo Co. (24,558.)

CITY PLANT.

Built in '74-5 by city. SUPPLY.—Arkansas River, flowing through ditch to reservoirs, thence by pumping direct. PUMPS.—Cap., 11,000,000 galls.; 2—5,500,000 Holly-Gaskill hor. high duty. Bituminous slack used; av. cost, $2 per short ton, delivered. RESERVOIRS. — Cap., 26,000,000 galls.; 2—13,000,000. DISTRIBUTION. — Mains, 41 miles. Taps, 2,400; made by property owner, no fee. Services paid for by property owner. Meters, 4. Use of meters compulsory for groceries and store rooms. CONSUMPTION.—(Galls.) av., 3,700,000. PRESSURE.—Ordinary, 105 lbs.; fire, 127 lbs. One steam fire engine is owned by city but not used. FINANCIAL.—Debt, $314,500: Floating, $64,500, at 10%; Bonded, $240,000, at 6%; due in 1914; $10,000 at 7%; due in '96. Expenses, Operating, $20,507. Revenue, Consumers, $30,813. SEWERS.—Has sanitary sewers only. REFERENCES.—Eng. News, Feb. 11, '82; new Co. works, Jan. 17, '91.

PUEBLO WATER CO.

Built in '81 by South Pueblo Water Co.; now owned by Pueblo Water Co. Upon consolidation of cities of Pueblo and South Pueblo in '86 it was agreed that citizens of Pueblo, which city owned its works, should retain their ownership, while that part formerly known as South Pueblo should continue their contract with the Co. In '90 franchise was extended for 25 yrs. FRANCHISE.—25 yrs. from '90; does not provide for purchase of works by city. Co. has exclusive right to supply water to territory south of Arkansas River. Max. rates are fixed by city ordinance. SUPPLY.—Arkansas River, pumping direct from settling basins. PUMP.—Cap., 14,000,000 galls.; 4,000,000 and 2—5,000,000 Worthington. RESERVOIR.—Area, 10 acres. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 47 miles. Taps, 2,550. Meters, 0. Hydrants, public, 232. CONSUMPTION.—(Galls.) av., 3,500,000. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Cap. Stock: Authorized, $300,000; all paid-up. Bonded debt, $250,000, at 6%. Income used in improvements. MANAGEMENT.—Secy. and Treas., J. A. Joy. Rept. by Prest., Geo. J. Dunbaugh, Dec. 28, '96. SEWERS.—Has sewers. NOTE.—The Pueblo Gravity Water Supply Co., which in '90-1 Manual was rept. as being about to build works, has done nothing whatever. Rept. by Prest. Pueblo Water Co.

54. **RED CLIFF,** Eagle Co. (383.) Built in '87 by city. SUPPLY. — Mountain stream, by gravity to reservoir. RESERVOIR.—Is 10 × 20 × 40 ft. DISTRIBUTION.—Mains, 1 mile. Taps, 50. Meters, 0. Hydrants, 4. PRESSURE.—Ordinary, 5 lbs. FINANCIAL.—Cost, $4,000. Debt, $1,300 at 8%. Revenue, Consumers, $1,200. NOTE.—No rept. since '90-1 Manual.

P 5. **RED MOUNTAIN,** Ouray Co. (Est., 172.) Town proposes to build small general system in '97. Supply, spring 110 ft. above town, by gravity. Est. cost, $2,000. Rept. by Town Clk., G. B. Thomas, Jan. 13, '97.

55. **RICO,** Dolores Co. (1,134.) Built in '87 by town. SUPPLY.—Silver Creek, by gravity. DISTRIBUTION.—Mains, 2,500 ft. Hydrants, public, 8. FINANCIAL.—Cost, $8,000. Bonded debt, $5,000, at 8%. MANAGEMENT.—Supt., Thos. Thompson. Rept. by Town Clk., W. B. Hess, Sept. 22, '96.

56. **RIDGWAY,** Ouray Co. (Not given.) Built in '90-1 by Ridgway Water & Power Co.; put in operation in July. Engr. and Contr., Gordon Kimball, Ouray. FRANCHISE.—20 yrs. from '90. City to pay $2.50 per yr. for 10 hydrants. SUPPLY.—Reservoir, by gravity. DISTRIBUTION.—Mains, 2 miles. Taps, 280; made by Co. at $5 for ½-in., $7.50 for ¾-in. and $10 for 1-in. Services paid for by property owners. Hydrants, public, 10; private, 1. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cap. Stock: Authorized, $30,000; all paid-up. Expenses, Operating, $600. Revenue, $2,750. City, fire protection, $250; other purposes, $2,500. MANAGEMENT.—Prest., Otto Mears, Denver. Rept. by Secy., A. E. Walther, July 11, '96. SEWERS.—Has sanitary sewers.

57. **ROCKVALE,** Fremont Co. (Est., 228.) Built in '93 by town; put in operation Mar. 28. Engr., C. W. Wells, Victor. Contr., Geo. A. Shields, Pueblo. SUPPLY.—Well. RESERVOIR.—Is 60 × 12 × 15 ft.; storage and distributing. FISCAL YEAR CLOSED Mar. 3. DISTRIBUTION.—Mains, 6⅛ miles; cost extensions met by appropriations. Taps, 235; made by town. Meters, 2; owned by town. Hydrants, public, 28. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $29,470. Bonded debt, $15,500, at 8%; due 1902. Expenses, int., $1,440. MANAGEMENT.—Rept. by Jno. Williams, June 14, '96.

58. **ROCKY FORD,** Otero Co. (468.) Built in '90 by city. SUPPLY.—Artesian wells, flowing to reservoirs. RESERVOIRS.—Cap., 1,575,000 galls.; two storage, 96 ft. above city. DISTRIBUTION.—Mains, 2 miles; cost extensions met by cash. Taps, 75; made by city for $2 each. Services, w. i.; paid for by consumer. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 3,600. PRESSURE.—Ordinary, 50 to 60 lbs. FINANCIAL.—Cost, $12,000. Floating debt, $10,000, at 7%. Deficits are met by taxation. MANAGEMENT.—Mayor. SEWERS.—None.

59. **SAINT ELMO,** Chaffee Co. (Est., 150.) Built by town. SUPPLY.—Chalk Creek.

by gravity from impounding reservoir, 170 ft. above town. DISTRIBUTION.—Taps made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 5. Every family is permitted the use of a hose. FINANCIAL.—No debt. Revenue, $1,000. Entire revenue, which pays all expenses, is from two saloons which pay $500 a year each. MANAGEMENT.—Rept. by P. Hurley, Chn. Water Com., Dec. 15, '96.

60. **SALIDA,** Chaffee Co. (2,586.) Built in '82 by town. SUPPLY.—Springs, about two miles from town, by gravity from reservoir. RESERVOIR.—Cap., 700,000 galls. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, about, 8 miles; cost extensions met by revenue. Taps, about, 600; made by consumer for $3.35. Hydrants, public, 39; private, 1. PRESSURE.—Fire, 85 lbs. FINANCIAL.—Cost, about, $100,000. Debt, $78,000: Floating, $18,000. Bonded, $60,000: $20,000, at 8%; due in '97; $20,000, at 6%; due in 1907; $20,000 at 7%; due in 1904. Expenses, Operating, $300. MANAGEMENT.—Trustees. Rept. by Supt., C. S. Johnson, June 8, '96. SEWERS.—None. REFERENCE.—Eng. News, Aug. 1, '85.

61. **SILVER CLIFF,** Custer Co. (546.) Now owned by city. Built in '80 by city; transferred to bondholders in '86, who organized Silver Cliff Water Supply Co. In '89 works were shut down. Not stated when they were started up, but about '94 city bought works from Co. and extended them. SUPPLY.—Pumping to reservoir. PUMP.—Cap., 1,500,000 galls.; Holly quad. (rept. by makers). DISTRIBUTION.—(In '94.) Mains, about 5 miles. No information except press repts. since '90-1 Manual.

62. **SILVER PLUME,** Clear Creek Co. (908.) Built in '94 by city; put in operation Dec. 1. Contrs., Lapp, Truscott & Myers. SUPPLY.—Clear Creek, by gravity to and from reservoir at elev. of 205 ft. DISTRIBUTION.—Mains, 3 miles; cost extensions met by city. Taps, 125; made by consumer for $1.50. Services, lead; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 14. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 6%. Revenue, $1,540: Consumers, unmetered, $700; City, fire protection, $840. MANAGEMENT.—Treas., F. Lapp; Supt., Wm. H. Thomas. Rept. by Mayor, C. H. Dyer, Dec. 1, '96. SEWERS.—None.

63. **SILVERTON,** San Juan Co. (Est., 2,000.) Bought by bondholders at auction, who organized Silverton Water Supply Co.; built in '82-3 by Silverton Water-Works Co. FRANCHISE.—20 yrs. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—(In '90.) Mains, 5 miles. Taps, 200. Meters, 0. Hydrants, public, 15. FINANCIAL.—(In '90.) Cost, $53,000. Cap. Stock, $71,000. No debt. Expenses, $1,200. Revenue, $7,900. MANAGEMENT.—Prest., B. L. Carr; Secy. and Treas., F. P. Secor, both of Longmont. Rept. by Mgr., B. B. Galvin, Sept. 25, '96. PROJECTED IMPROVEMENTS.—Flume, 7,300 ft. long is being built at a cost of $2,000, from dam to reservoir, to supplement pipe line, owing to increased demand.

20. **SOUTH DENVER,** Arapahoe Co. Now part of Denver, which see.

64. **TELLURIDE,** San Miguel Co. (766.) Built in '86 by town. SUPPLY.—Cornet and Mill Creeks, by gravity. RESERVOIRS.—Cap., about 490,000 galls.: Cornet, 140,000; new, 350,000; built in '96. A supply main 14,000 ft. long, mostly of 8-in. steel pipe, leads to new reservoir. (Press repts.) FINANCIAL.—Bonded debt, $22,000 at 8%. NOTE.—No official rept. since '90-1 Manual.

65. **TRINIDAD,** Las Animas Co. (5,523.) Built in '79 by Trinidad Water-Works Co. Press repts. state people voted to buy works in Nov., '96, and that early in '97 appraisers had been appointed; price to be 15% in advance of cost of duplicating plant. FRANCHISE.—25 yrs. from '89; provides for purchase of works by city in '90 and every 5 yrs. thereafter. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. LEGAL DIFFICULTIES.—Co. has been in litigation since '90; city has paid no hydrant rental; city claims fraud and illegal contracts. Court has each time sustained Co. and a settlement appears about to be made. (See later information above; press rept. states city will pay up back hydrant rental). SUPPLY.—Las Animas River, by gravity to settling reservoir, thence pumping to distributing reservoir. PUMPS.—Cap., 2,000,000 (?) galls.; 2—1,000,000 (makers rept. one); Cope & Maxwell. Av. cost of coal used, $1.50 per short ton. RESERVOIRS.—Two storage and settling, eight miles above city; one storage and distributing, in city. FISCAL YEAR CLOSED Oct. 1. DISTRIBUTION.—Mains, 22 miles; cost extensions met by revenue. Taps, 1,053. Services, lead and iron; paid for by consumer. Meters: 50; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 130. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary and fire, 120 lbs. FINANCIAL.—Cost, $300,000. Cap. Stock: Authorized, $50,000; all paid up; paid no div'd in '95. Pref'd, authorized, $50,000; all paid-up. Debt, $280,000: Floating, $30,000; Bonded, $250,000, at 6%; due in 1909. No sinking fund. Expenses, Operating, $2,880; taxes, $1,751. Revenue, $29,813: Consumers, unmetered, $17,925; metered, $3,728; City, fire protection, $7,800; street sprinkling, $300; sewers flushing, $60. MANAGEMENT.—Prest., Delos A. Chappell. Rept. by Secy., Treas. and Supt., W. B. Cunningham, Nov. 19, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Apr. 15, '82.

31. **UTE PARK** (P. O. Cascade), El Paso Co. (Not given.) Supply from Green Mountain Falls.

66. **VICTOR**, El Paso Co. (Not given.) Built in '96 by city. SUPPLY.—Mountain streams, by gravity. Press rept. early in '97 indicated that works would be greatly improved.

20. **VILLA PARK**, Arapahoe Co. (Precinct, 1,754.) See Denver.

67. **WALSENBURG**, Huerfano Co. (928.) Built in '88 by Walsenburg Water Co. FRANCHISE.—Exclusive. SUPPLY.—Lake Miriam, by gravity. Lake is ⅛ × 1 mile, 25 ft. deep; 8½ miles from and 265 ft. above town. DISTRIBUTION.—(In '88.) Mains, 6.8 miles. Taps, 160. Meters, 0. Hydrants, public, 16. PRESSURE.—(In 88.) Ordinary, 80 lbs.; fire, 115 lbs. FINANCIAL.—(In '88.) Cost, $70,000. Cap. Stock, $75,000. Bonded debt, $30,000, at 8%. Expenses, $2,800: Operating, $400; int., $2,400. Revenue, $6,600: Consumers, unmetered, $3,400; City, fire protection, $3,200. MANAGEMENT.—(In '89.) Prest., Fred Walsen; Secy. and Treas., T. F. Martin; Supt., F. O. Roof. Rept. by P. W. Sweeney, Agent, Sept. 24, '96.

—? **WESTCLIFFE**, Custer Co. (192.) Small works under construction by town July, '96, said to be for general use. Supply, well, pumping to reservoir. Cost, about $1,500. Rept. by Recorder, J. S. Truex.

68. **YUMA**, Yuma Co. (241.) Built about '87 by town. SUPPLY.—Well, 200 ft. deep, pumping to tank and direct. PUMP.—Cap., 63,000 galls.; Columbus, Ohio; also 16-ft. aeromoter. Maitland coal used; av. cost, $6 per short ton. TANK.—Cap., 63,000 galls.; wood. FISCAL YEAR CLOSED Apr. 1, '96. DISTRIBUTION.—Mains, 9,400 ft.; cost extensions met by consumers. Taps, 500; made by city for $2. Services, galv. i.; paid for by consumer. Meters, 0. Any consumer may have a meter. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 6,000; max., 9,000; min., 3,000. PRESSURE.—Ordinary, 70 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $10,500. Bonded debt, $7,500, at 8%; due in 15 yrs. Expenses, $850: Operating, $250; int., $600. Revenue, consumers, $400. MANAGEMENT.—Rept. by Ch. Pump. Engr., Jos. Buchanan, Jan. 11, '97. SEWERS.—None.

NEW MEXICO.

1. **ALBUQUERQUE**, Bernalillo Co. (5,518.) Built in '86 by Albuquerque Water Co.; name changed since to Water Supply Co. FRANCHISE.—25 yrs. from '95. No legal difficulties. SUPPLY.—Wells, pumping to reservoir. In '89 there was a 20 × 25-ft. surface well and 52—3 ins. × 40-ft. driven wells. PUMPS.—Cap., 2,000,000 galls.; Holly-Gaskill hor. high duty. Bituminous slack coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 3,500,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 10 miles; cost extensions met by Co. Taps made by consumer. Services, lead; paid for by consumer. Meter : 160; owned, controlled and repaired by Co. Co can compel use of meters and any consumer may have one. Hydrants, public, 96; private, 8. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 85 lbs.; fire, 120 lbs. FINANCIAL.—Cap. Stock: Authorized, $500,000. MANAGEMENT.—Prest., A. A. Grant; Ch. Pump. Engr., N. E. Stevens. Rept. by Secy., Treas., and Supt., B. F. Davis, Sept. 21, 96'. SEWERS.—Has sanitary sewers only.

2. **CLAYTON**, Union Co. (Est., 330.) Built in '86 by U. P. Ry. Co. Press rept. in '92 stated Clayton Electric Light & Water Supply Co. had been incorp.; authorized cap. stock, $20,000. FRANCHISE.—Rates are not subject to regulation by city. SUPPLY.—Spring, pumping to tank. PUMPS.—Knowles dup. TANK.—Cap., 60,000 galls.; 186 ft. above town. DISTRIBUTION.—Mains, 2 miles. Hydrants, 4. FINANCIAL.—Cost, $3,000. NOTE.—No rept. since '90-1 Manual.

—? **DEMING**, Grant Co. (1,136.) Press repts. in '92 and '93 stated works were being built by the Deming Land & Water Co. for domestic, fire and irrigation uses, including a 40,000,000-gall. reservoir.

4. **EAST LAS VEGAS**, San Miguel Co. (2,812.) See Las Vegas.

3. **EDDY**, Eddy Co. (Est., 278.) Built in '93 by City Water-Works Co. SUPPLY.—Wells, pumping to tank, near wells. Wells are 70 ft. deep, connected by tunnel; in a dry canyon three miles from city. FINANCIAL.—Cost (in '93), about $50,000. NOTE.—Rept. by J. A. Eddy, July 31, '93.

4. **LAS VEGAS**, San Miguel Co. (2,885.) Built in '81-2 by Aqua Pura Co. FRANCHISE.—50 yrs. from '81; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. City to pay $2,790 per yr. for public service. No legal difficulties. SUPPLY.—Gallinas River, by gravity. RESERVOIR.—Cap., 20,000 galls.; impounding. DISTRIBUTION.—Mains, 20 miles. Taps, 750; made by Co., free. Services, w. i.; paid for by property owner. Meters: 6; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 36; private, 6. PRESSURE.—Ordinary, 120 lbs. FINANCIAL.—Cost, $150,000. Bonded, $120,000, at 6%; due in 20 yrs. Sinking

Fund, $20,000. MANAGEMENT.—Prest., J. D. Powers, Owensboro, Ky. Rept. by Secy. and Supt., F. H. Pierce, East Las Vegas, Aug. 10, '96. REFERENCE.—Eng. News, Dec. 16, '82.

5. **MAXWELL CITY**, Colfax Co. (Not given.) Built in '90 by Maxwell City, Land & Improvement Co.; now known as Maxwell City Development Co. The plant is owned by a town Co. and is run as a means of advertising, not paying int. on the investment direct. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 50,000 galls.; storage. DISTRIBUTION.—Mains, 2½ miles. Meters, 0. Fees are merely nominal. Hydrants, public, 1. PRESSURE.—Ordinary, 40 lbs. MANAGEMENT.—Rept. by E. S. Warren, Mgr., June 5, '96. SEWERS.—None.

6. **RATON**, Colfax Co. (1,255.) Transferred in '91 to Raton Water-Works Co.: built in '80-1 by A., T. & S. F. Ry. Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs and wells, by gravity from former and by pumping to reservoir from latter. PUMPS.—Cap., 230,000 galls.; two Knowles dup. RESERVOIR.—Cap., 52,000,000 galls.; located in the Canyon of Chicorica, 458 ft. above and seven miles from town. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 14.7 miles. Hydrants, public, 44. PRESSURE.—(In '89.) Ordinary, 60 lbs. MANAGEMENT.—Prest. and Treas., Wm. E. Hawks, Bennington, Vt.; Gen. Mgr., C. N. Priddy, Leadville, Colo. Rept. by Supt., A. L. Hobbs, Nov. 1, '96. REFERENCES.—Eng. News, Dec. 23, '82; filter beds, Apr. 16, '92, illus.

P 1. **ROSWELL**, Chaves Co. (Est., 348.) Dec. 22, '96, Chas. H. Sparks, Chn. Com., rept. town trustees had taken preliminary steps for vote on issuing $20,000 bonds for works.

7. **SANTA FE**, Santa Fe Co. (6,185.) Built in '81-3 by Water & Improvement Co.: works enlarged since '92. Engr., J. M. Howells, San Diego, Cal. FRANCHISE.—25 yrs. from '92. No legal difficulties. SUPPLY.—Santa Fe River, by gravity from impounding reservoir. RESERVOIR.—Cap., 250,000,000 galls.; storage, in Santa Fe Canon, 3½ miles from and 345 ft. above town. DISTRIBUTION.—Mains, 20 miles. Meters: 9; owned and controlled by Co. Meters are only used for irrigation consumers where quantity of water used is uncertain. Hydrants, public, 40; private, 10. PRESSURE.—Ordinary, 50 lbs.; fire, 100 lbs. MANAGEMENT.—Prest., S. H. Day. SEWERS.—None. REFERENCES.—Eng. News, Apr. 14, '83; description of dam and use of goats for puddling, Apr. 18, 27, '93.

8. **SILVER CITY**, Grant Co. (2,102.) Now owned by J. B. Foster, Westerly, R. I., since '90; built in '86-7 by Silver City Water Co. FRANCHISE.—50 yrs. from '87; provides for purchase of works by city after 10 yrs. or every 5 yrs. thereafter upon 1 yr.'s notice. City pays hydrant rental, 20-yr. contract. LEGAL DIFFICULTIES.—In '91 city attempted to annul franchise and had not paid hydrant rental. SUPPLY.—Wells and drifts, pumping to reservoir and direct. PUMPS.—Cap., 1,000,000 galls.: 500,000 Knowles; 500,000 Deane. Wood (pine and juniper) used; av. cost, $2.75 per cord. RESERVOIR.—Cap., 250,000 galls.; storage, 225 ft. above city. DISTRIBUTION.—Mains, 9 miles. Taps made by Co. for $5. Services, iron; paid for by consumer from sidewalk. Meters: 40; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for large consumers. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 75,000; max., 100,000; min., 50,000. Stamp-mill uses 20,000 galls. daily. PRESSURE.—Ordinary, 100 lbs.; fire, 140 lbs. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $100,000; all paid-up. Debt, $77,500: Floating, $2,500; Bonded, $75,000, at 6%. Expenses, $8,300: Operating, $3,200; int., $4,500; taxes, $600. MANAGEMENT.—Prop., J. B. Foster; Mgr., E. B. Foster; both of Westerly, R. I.; Ch. Pump. Engr., L. C. Munger. Rept. by Supt., A. F. Nichol, June, '96. PROJECTED IMPROVEMENTS.—New well to be sunk and drifts to be extended. SEWERS.—None.

9. **SOCORRO**, Socorro Co. (Est., 3,829.) Built in '87 by city. SUPPLY.—Mountain springs, by gravity. DISTRIBUTION.—(In '88.) Mains, 5½ miles. Hydrants, 25. FINANCIAL.—(In '88.) Cost, $30,000. Bonded debt, $30,000, at 6%. NOTE.—No rept. since '90-1 Manual.

10. **SPRINGER**, Colfax Co. (Est., 1,114.) Built in '90 by Aqua Crystalina Water Co. Press repts. state works were sold in Nov., '93, and that they would be extended; also that Springer Water & Electric Light Co. was incorp. by same parties in Mar., '94. SUPPLY.—Wells, pumping direct. PUMP.—Knowles. DISTRIBUTION.—Mains, 2 miles. FINANCIAL.—Cost, $13,000. Bonded debt, $6,000. Expenses, $1,000. Revenue: Consumers, $1,800; City, fire protection, none. NOTE.—No rept. since '90-1 Manual.

GROUP VIII.—PACIFIC STATES.

Water-Works Completed, in Process of Construction or Projected, in Washington, Oregon, California, Arizona, Nevada, Utah, Idaho and Alaska.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

WASHINGTON.

1. **ABERDEEN,** Chehalis Co. (1,638.) Built in '91 by city; small system, chiefly for fire protection was built previously and was bought by city (in '91?) SUPPLY.—Brook, pumping direct. PUMPS.—Cap., 1,750,000 galls.; 1,250,000 Worthington comp. non-cond., 500,000 Dow. DISTRIBUTION.—Mains, 3 miles. Services, w. i. Hydrants, 15. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $45,000. Bonded debt, $40,000. Sept., '91, $65,000 in bonds were to be voted to pay for old works bought by city and construction of new works. NOTE.—No rept. since '90-1 Manual.

2. **ANACORTES,** Skagit Co. (1,131.) Built in '90 by Anacortes Water Co.; controlled by Oregon Improvement Co.; put in operation June, '91. FRANCHISE.—99 yrs. from '91; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Lake, by gravity to and from reservoir. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 3½ miles. Taps, 48; made by consumer, no fee. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 8. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 125 lbs. MANAGEMENT.—Prest., C. J. Smith; Secy., J. T. Campion; Supt., B. F. Bush, all of Seattle. Rept. by Asst. Supt., E. W. Clark, June 11, '96. SEWERS.—None.

3. **BALLARD,** King Co. (1,173.) Bought by city in '95; built in '88 by West Coast Water Co. SUPPLY.—Springs, by gravity, and open wells, by pumping. PUMPS.—Cap., 1,000,000 galls.; Worthington vert. comp. cond., with packed plunger (rept. by maker). RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 4 miles. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $80,000.

4. **BLAINE,** Whatcom Co. (1,563.) Built in '90-1 by Northwest Water Co.; put in operation July 1. FRANCHISE.—25 yrs. from '91; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay $84 per hydrant per yr. No legal difficulties. SUPPLY.—Springs, at elev. of 100 ft., 2½ to 3 miles from city, by gravity to reservoir. RESERVOIR.—Cap., 12,000,000 galls. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 5 miles; cost extensions met by Co. Taps, 40: made by Co. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—Cost, about, $65,000. Cap. Stock: authorized, $100,000. Bonded debt, $40,500 at 6%. Sinking Fund, None. Expenses. Operating, $450. MANAGEMENT.—Secy., Walter Johnson: Treas., F. B. Wiestling; Supt., J. S. Crilley. Rept. by Prest., J. M. Wiestling, Seattle, Sept. 1, '96. SEWERS.—None.

5. **BUCKLEY,** Pierce Co. (Precinct, 878.) Built in '93 by city; put in operation Apr. 9. Engr., A. B. Wood, Tacoma. Contrs., Dwyer Bros., Seattle. SUPPLY.—River, pumping to tank and direct. PUMP.—Cap., 600,000 galls.; Deane dup. FILTERS.—

Sand. TANK.—Cap., 47,000 galls.; redwood. DISTRIBUTION.—Mains, 4 miles; cost extensions met by water fund. Taps, 60; made by consumer. Services, ¾-in. galv. l.; paid for by property owner. City can compel use of meters and any consumer may have one. Hydrants, public, 12. PRESSURE.—Ordinary, 24 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $9,500 at 6%. Expenses, Operating, $720. Deficits are met in full by taxation. MANAGEMENT.—Prest., W. E. Adams; Secy., R. J. Miller. Rept. by Ch. Pump. Engr., H. E. Rogers, Sept. 7, '96. SEWERS.—Has storm sewers.

6. **CASTLE CREEK,** Cowlitz Co. (681.) Built in '96 by Castle Rock Water Co.; put in operation Nov. 1. Contr., H. Orchard. FRANCHISE.—30 yrs. from '96, with option of purchase of works by city after 4 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 226,000 galls.; 133 ft. above town. DISTRIBUTION.—Mains, 5 miles; cost extensions met by revenue. Taps, 150; made by Co. for $1.50. Services paid for by consumer. Meters, 0. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 15,000; max., 20,000; min., 12,000. PRESSURE.—Ordinary and fire, 56 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $15,000; all paid-up. No debt. Expenses, Operating, 5% of collections. Revenue, $2,000: Consumers, unmetered, $1,800; City, fire protection, $200. MANAGEMENT.—Secy., C. A. Doty, Kalama; Treas., J. P. Atkin, Kalama; Supt., L. W. Carner. Rept. by Prest., H. Orchard, Dec. 15, '96. SEWERS.—Owned by water Co.

7. **CENTRALIA,** Lewis Co. (2,026.) Built in '90-1 by Centralia Water Co.; put in operation March 1. FRANCHISE.—20 yrs. City to pay $84 per hydrant per yr. SUPPLY.—Well, near Skorkum Chuck River, pumping to reservoir. PUMP.—Cap., 750,000 galls.; Worthington. RESERVOIR.—Cap., 1,200,000 galls. DISTRIBUTION.—Mains, 6.5 miles. Services, galv. l. Hydrants, 25. PRESSURE.—95 lbs. FINANCIAL.—Cost, $45,000. Cap. Stock, authorized, $50,000. Expenses, Operating, $2,500. Revenue, City, fire protection, $2,100. NOTE.—No rept. since '90-1 Manual.

8. **CHEHALIS,** Lewis Co. (1,309.) Built in '92 by Chehalis Water Co.; put in operation Nov. 1. Engr., John Corkish, Portland, Ore. FRANCHISE.—30 yrs. from '91; provides for purchase of works by city after 10 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. City to pay $100 per yr. per hydrant for first 20, $50 for each additional. No legal difficulties. SUPPLY.—Mountain stream, pumping to reservoir. PUMP.—Cap., 750,000 galls.; Worthington. Wood used; av. cost, $1.75 per cord. RESERVOIR.—Cap., 600,000 galls. FISCAL YEAR CLOSED Oct. 31. DISTRIBUTION.—Mains, 7½ miles; cost extensions met by revenue. Taps, 310; made by Co. free. Services, galv. l.; paid for by consumer. Co. can compel use of meters and any consumer may have one. Hydrants, public, 26; private, 4. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $42,000. Cap. Stock: Authorized, $50,000; paid-up, $42,000; paid no div'd in '95. Floating debt, $15,000, at 10%. Sinking Fund, none. Expenses, Operating, $1,800; taxes, $450. Revenue, $6,500: Consumers, $3,600; City, fire protection, $2,300; other purposes, $600. MANAGEMENT.—Secy., E. S. Hamlen, Olympia; Supt., A. D. Sheldon. Rept. by Prest., J. Corkish, Portland, Ore., June 18, '96. SEWERS.—Has sanitary and storm sewers.

P 1. **CHELAN,** Okanogan Co. (Not given.) Unsigned rept., July, '96, stated works would probably be built by Co. in '97. Supply, Chelan River. Feb., '97, press rept. stated works were to be built.

9. **CHENEY,** Spokane Co. (647.) Built in '90 by Cheney Water & Land Co. FRANCHISE.—30 yrs. Rates are subject to regulation by city. City to pay $196 per hydrant per yr. SUPPLY.—Lake, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Knowles. RESERVOIR.—Cap., 250,000 galls. DISTRIBUTION.—(In '90.) Mains, 3.5 miles. Services, galv. l. Hydrants, public, 11. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—(In '90.) Cost, $41,000. Cap. Stock: Authorized, $100,000; paid-up, $25,000. Bonded debt, $35,000, at 7%. Expenses, $4,370; Operating, $1,920; int., $2,450. Revenue, $4,740: Consumers, $2,640; City, fire protection, $2,100. MANAGEMENT.—Prest., D. F. Percival; Secy., R. A. Hutchinson; Treas., C. A. Hutton. Rept. by Mgr., S. G. Grubb.

10, —? **COLFAX,** Whitman Co. (1,649.)

CITY WORKS.

Built in '92. SUPPLY.—Filter crib, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Worthington non-cond. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, about 5 miles. FINANCIAL.—Cost, about $60,000. NOTE.—Subject to revision.

SPRING WATER CO.

Built in '88. See note. SUPPLY.—Springs, by gravity to reservoir. RESERVOIR.—Cap., 600,000 galls. DISTRIBUTION.—Mains, 4 miles. FINANCIAL.—Cost, $10,000. NOTE.—No rept. since '90-1 Manual. This plant may have been sold to city or abandoned.

—? **COLTON,** Whitman Co. (Est., 410.) Aug. 31, '96, citizen rept. place had works. Press rept., Oct., '92, stated contract for works had been let by city to P. B. Dyer & Co., Seattle; also that $10,000 water bonds had been sold.

D 1. **COLUMBIA CITY,** King Co. (Not given.) Bought by town in Apr., '96; built in '91 by Columbia Home Co. for family and irrigation purposes. Supply, springs, by gravity from 25,000-gall. reservoir. Mains, 1½ miles; cost extensions met by water fund. Taps, 35; made by town, free. Services, iron; paid for by owner of property. City can compel use of meters and any consumer may have one. Pressure, ordinary, 5 to 30 lbs. Cost, $2,600. Expenses, operating, nominal. Revenue, consumers, $180. Rept. by Clk. of W. Comrs., J. A. Kelso, Sept. 19, '96. No sewers.

P 2. **COUPEVILLE,** Island Co. (513.) Built in '89 by Coupeville Water Co., for domestic supply. City neither controls rates nor has right to buy works. Supply, spring, pumping to tank and direct. Mains, 2 miles. Taps, 25. Cost, $4,500. Cap. Stock, $4,000; paid no div'd in '90. No debt. Expenses, $805. No rept. since '90-1 Manual.

11. **DAYTON,** Columbia Co. (1,880.) Built in '91 by city; put in operation Sept. 15. SUPPLY.—Infiltration gallery by side of and under mountain stream, by gravity to and from reservoir. RESERVOIR.—Cap., 700,000 galls. DISTRIBUTION.—Taps made by city for $8. Services, iron; paid for by consumer. Use of meters optional with city. Hydrants, public, 67. PRESSURE.—Ordinary and fire, 65 lbs. One steam fire engine. FINANCIAL.—Cost, $80,000. Bonded debt, $75,000, at 6%; due in 20 yrs. Sinking Fund begins in seventh year from issue of bonds. Expenses, $5,500: Operating, $1,000; int., $4,500. Revenue, Consumers, $6,500. MANAGEMENT.—Secy., C. F. Miller; Treas., F. W. Gurnsey; Supt., N. Smith. SEWERS.—Has sanitary sewers only.

12. **ELLENSBURGH,** Kittitas Co. (2,768.) Now owned by Ellensburgh Water Supply Co.; built in '88 by Capital Hill Water Co. FRANCHISE.—45 yrs. from '89; provides for purchase of works by city in 14 yrs. Rates are subject to regulation by city. Co. is not exempt from local taxes. LEGAL DIFFICULTIES.—Suit as to contract for hydrant rental. SUPPLY.—Wilson Creek, in Cascade Mts., by gravity to reservoirs. RESERVOIRS.—Cap., 4,000,000 galls.; three: One 3,000,000; two 500,000. DISTRIBUTION.—Mains: Cost extensions met by receipts. Taps, 150; made by Co. at cost. Services, galv. i.; paid for by consumer. Meters: 7; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for public buildings. Hydrants, public, 3. CONSUMPTION.—(Galls.) av., 750,000; max., 1,000,000; min., 300,000. Water is used in summer for irrigating. PRESSURE.—Ordinary, 65 lbs.; fire, 70 lbs. Steam fire engines are used. FINANCIAL.—Cost, $60,000. Cap. Stock: Authorized, $125,000. Floating debt, $65,000, at 6%. Expenses, $5,900: Operating, $2,400; int., $3,300; taxes, $200. MANAGEMENT.—Prest., W. W. Seymour; Secy., L. B. Lockwood. Rept. by Mgr., J. C. Hubbell. SEWERS.—Has sanitary sewers.

13. **ELMA,** Chehalis Co. (345.) Bought in '94 by city and improved; built in '91 by Elma Water Co. SUPPLY.—Mountain brooks, by gravity. RESERVOIR.—Cap., 85,000 galls.; storage, 90 ft. above city. FISCAL YEAR CLOSED Aug. 1. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by water-works fund. Taps, 90; made by city at $5 for ½-in.; $5.50 for ¾-in.; $6 for 1-in. Services, galv. i.; paid for by property owner. Meters, 0. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 45,000; max., 52,000; min., 30,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $8,500. Bonded debt, $9,000 at 6%. Expenses, $588: Operating, $48; int., $540. Revenue, $670. System has been self-supporting. MANAGEMENT.—Rept. by A. J. L. McSperitt, Aug. 15, '96. SEWERS.—None.

14. **EVERETT,** Snohomish Co. (Est., 6,000.) Built in '92 by Everett Water Co. SUPPLY.—Springs, pumping to reservoir. PUMP.—Cap., 1,000,000 galls.; Worthington comp. non-cond. (rept. by makers). RESERVOIR.—Cap., about 1,000,000 galls. (press rept.) DISTRIBUTION.—Mains, about 10 miles. MANAGEMENT.—Rept. by Vice-Prest. and Treas., Schuyler Duryea, June 11, '96.

15. **FAIRHAVEN,** Whatcom Co. (4,076.) Built in '90 by Fairhaven City Water & Power Co. FRANCHISE.—50 yrs. from '90; provides for purchase of works by city at end of 20 yrs. Rates are fixed in franchise. Co. is not exempt from local taxes. Contract with Great Northern R. R. Co. for 10 yrs. No legal difficulties. SUPPLY.—Lake Padden and three creeks which empty into Lake Samish, by gravity. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 19 miles; cost extensions met by revenue. Taps, 250; made by Co. for $8.50. Services, galv. i.; paid for by property owner. Meters: 2; owned, controlled and repaired by Co. Use of meters compulsory for hotel. Co. can compel use of meters and any consumer may have one. Hydrants, public, 40. PRESSURE.—Ordinary, 80 lbs.; fire, 160 lbs. One steam fire engine is used. FINANCIAL.—Cost, $103,000. Cap. Stock: authorized, $100,000. Debt, $52,000: Floating, $2,000 at 10%; Bonded, $50,000 at 5%. Expenses, $5,020: Operating, $2,000; int., $2,680; taxes, $340. Revenue, City, fire protection, $3,600. MANAGEMENT.—Prest., J. J. Donivan; Secy., E. L. Cougill; Treas., John H. Ware. Rept. by T. W. Gillette, June 16, '96. SEWERS.—Has sanitary and storm sewers.

16. **GARFIELD,** Whitman Co. (317.) Built in '93 by town. SUPPLY.—Well, pumping to reservoir and direct. Rock Springs, Wyo., coal used, av. cost, $7 per short ton. RESERVOIR.—Cap., 150,000 galls.; ¼ mile from city on 100 ft. elevation. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by city from water fund. Taps, 30; made by town. Services, iron; paid for by city and

taxes. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 9. CONSUMPTION.—(Galls.) av., 9,000. PRESSURE.—Ordinary, 45 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $13,000. Debt, $13,000: Floating, $5,000, at 6%; Bonded, $8,000 at 6%; due 1913. Sinking Fund, none until five years prior to maturity of bonds. Expenses, Operating, $400; int., $780. Revenue, Consumers, $480; City, none. MANAGEMENT.—Prest., J. T. Penn, Mayor. Rept. by Supt., S. W. Reeder, July 27, '96. SEWERS.—Has storm sewers only.

17. **GOLDENDALE**, Klickitat Co. (702.) Built in '90 by city. SUPPLY.—Spring, pumping to reservoir. PUMP.—Cap., 750,000 galls.; Hall. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 100. Hydrants, 12. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—95 lbs. FINANCIAL.—Cost, $12,500. NOTE.—No rept. since '90-1 Manual.

18. **HOQUIAM**, Chehalis Co. (1,302.) Built in '82 by North Western Lumber Co., belonging to its mill plant. Co. has never asked for franchise, as it does not care to keep up the water business. Works may be built by another Co. SUPPLY.—Springs and small streams, pumping to reservoir. DISTRIBUTION.—(In '90.) Mains, 3 miles. Taps, 275. Hydrants, 10. FINANCIAL.—Cost, $10,000. Expenses, $3,000. Revenue, Consumers, $6,000; City, fire protection, none. MANAGEMENT.—Rept. by J. F. Soule, June 8, '96.

19. **KALAMA**, Cowlits Co. (825.) Built in '96 by Orchard Water Co.; put in operation June 1. Engr. and Contr., H. Orchard. FRANCHISE.—30 yrs. from '95. Rates are subject to regulation by city for household use. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Mountain springs, by gravity. RESERVOIR.—Cap., 256,000 galls.; impounding, 1 mile from limits of town, 400 ft. above business portion; covered and ventilated. DISTRIBUTION.—Mains, 4 miles; cost extensions met by sinking fund. Taps, 275; made by Co. free to curb. Services, galv. i.; paid for by consumer. Meters: 20; owned, controlled and repaired by Co; yearly rental, none. Co. cannot compel but may prohibit use of meters. Hydrants, public, 12; private, 25. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 173 lbs. FINANCIAL.—Cost, $7,000. Cap. Stock: authorized, $7,000; all paid-up; paid 20% div'd in '95; 10% div'd guaranteed. Sinking Fund, 2% of capital stock, invested in 90-day loans @ 10%. Expenses, $141: Operating, $120; taxes, $21. MANAGEMENT.—Secy., J. P. Atkins; Treas., F. P. Atkins; Supt., C. A. Doty. Rept. by Prest., H. Orchard, July 27, '96. SEWERS.—None.

20. **KENT**, King Co. (853.) Owned by city. Rept. as first supplied in '89 by Kent Water Supply Co. Press rept., Apr., '92, stated city was to vote on issuing bonds for purchase of water system of Kent Water & Light Co. at $7,000; Farmers' Water Co. at $4,250; and about $11,000 additional bonds for pumping plant and reservoir. Unsigned rept. from Kent, Oct., '96, stated: "Present system owned by city."

—? **KIRKLAND**, King Co. (Est., 1,000.) Kirkland Land & Improvement Co. began construction of Water-Works June 1, '91. Plant has been completed but never operated. PUMP.—Gordon. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 2 miles. Services, w. i. MANAGEMENT.—Rept. by Kirkland Land & Improvement Co.

21. **LA CONNER**, Skagit Co. (398.) Built in '88 by La Conner Water-Works Co. SUPPLY.—Spring, pumping from receiving to distributing tank. PUMPS.—Cap., 25,000 galls.; two, steam and windmill. TANKS.—Cap., 21,000 galls.; one 12 x 16 x 10 ft., one 10 x 12 x 8 ft. DISTRIBUTION.—(In '88.) Mains, 3 miles. Hydrants, 60. CONSUMPTION.—(Galls.) av., 3,000. FINANCIAL.—(In '89.) Cost, $6,000. Cap. Stock, $6,000. No debt. Expenses, $300. Revenue, $1,200. NOTE.—No rept. since '90-1 Manual.

22. **MEDICAL LAKE**, Spokane Co. (617.) Built in '92 by city. SUPPLY.—Clear Lake. State of Washington has a 500,000-gall. granite reservoir and 2½ miles of pipe line. City is supplied with water at 12 cts. per 1,000 galls. DISTRIBUTION.—Mains, 2½ miles. Taps, 30; made by city for $4. Services, galv. i.; paid for by consumer. Hydrants, public, 16. PRESSURE.—Ordinary, 75 to 100 lbs. FINANCIAL.—Cost, $16,000; for city mains and fire service. Bonded debt, at 6%; to run for 16 yrs. yet. Expenses, $1,060: Operating, $100; int., $960. MANAGEMENT.—Supt., Theo. Scholer. Rept. by Stanley Hallett, Cy. Treas., Sept. 7, '96. SEWERS.—None.

23. **MONTESANO**, Chehalis Co. (1,632.) Built in '92 by Co. SUPPLY.—Mountain stream, by gravity (press rept.). NOTE.—Rept. by Cy. Clk., D. W. Fleet, July 28, '96.

P 2. **MOUNT VERNON**, Skagit Co. (770.) City voted $14,000 bonds early in '96, but had not been able to sell them at time of rept. Supply, Skagit River, pumping to reservoir. Est. cost, $14,000. Rept. by Mayor, J. P. Houser, Sept. 5, '96.

—? **NEW TACOMA** (P. O. Tacoma), Pierce Co. (Not given.) Makers rept. 1,000,000-gall. Holly hor. water power and a Goulds pump.

24. **NEW WHATCOM**, Whatcom Co. (Precinct, 2,140, including Sehome Junction.) Bought by city in '93; built in '89-90 by Bellingham Bay Water Co. SUPPLY.—Lake Whatcom, by gravity. Lake 3 miles from and 812 ft. above city; area, 7½ sq. miles. DISTRIBUTION.—Taps, 1,260. Meters, 0. FINANCIAL.—Purchase price (press rept.),

$144,000. MANAGEMENT.—Rept. by Supt., D. S. Jenkins, Feb. 26, '97. REFERENCES.—Submerged wooden pipe, May 23, June 27, '95.

25. **NORTH YAKIMA,** Yakima Co. (1,535.) Built in '90-1 by Yakima Water Co. FRANCHISE.—25 yrs. Does not provide for purchase of works by city. Max. rates are subject to regulation by city. SUPPLY.—Natchez River, by gravity, with direct pumping in emergency. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 Holly hor. water-power. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Mains, 6.5 miles. Hydrants, public, 30. PRESSURE.—Ordinary, 40 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $210,000. Cap. Stock, $300,000. No debt. MANAGEMENT.—Treas., W. L. Steinweg; Supt., A. B. Whitson. Rept. by Prest., Edw. Whitson, Sept. 21, '97.

26. **OLYMPIA,** Thurston Co. (4,698.) Built in '66 by Olympia Water Co.; reconstructed in '90 by Olympia Water-Works Co. FRANCHISE.—25 yrs.; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. City to pay $100 each for first 20 hydrants and $75 for each additional. SUPPLY.—Moxlie Creek, through wooden flume, 1,000 ft. long, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp. non-cond. RESERVOIR.—Cap., 1,750,000 galls. DISTRIBUTION.—Mains, 15 miles. Taps, 357. Services, w. i. Meters, 3. Hydrants, 42. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—50 to 90 lbs. FINANCIAL.—Cost, $245,202. Cap. Stock, $150,000. Bonded debt, $75,000, at 7%; due in 20 yrs. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 5, '84.

27. **ORTING,** Pierce Co. (623.) Built in '89 by Orting Light & Water Co. SUPPLY.—Springs, by gravity to tank. TANK.—Is 14 x 14 x 10 ft. DISTRIBUTION.—Mains, 5 miles. Taps, 120. Services, galv. i. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—100 lbs. FINANCIAL.—Cost, $5,000. Cap. Stock, $5,000. No debt. Expenses, $100. Revenue, $1,400. NOTE.—No rept. since '90-1 Manual.

28. **PALOUSE,** Whitman Co. (1,119.) Built in '88 by village. SUPPLY.—Palouse River, pumping to reservoir. Press rept. in '93 stated supply from well had been secured and that new 90,000-gall. steel tank or stand-pipe was to be built. PUMP.—Cap., 1,200,000 (?) galls.: 600,000 Blake rept. in '89; makers rept. 600,000 Worthington simple high pressure. RESERVOIR.—Cap., 120,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 43. Hydrants, 8. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—(In '89.) Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $9,000. Debt, $3,800. Expenses, $1,285: Operating, $1,000; int., $285. NOTE.—No rept. since '90-1 Manual.

29. **POMEROY,** Garfield Co. (661.) Built in '87 by city. SUPPLY.—Pataha Creek, through mill race, pumping to reservoir. PUMP.—Cap., 250,000 galls.; Dow water-power, at mill. RESERVOIR.—Is 30 x 90 x 16 ft. deep. FISCAL YEAR CLOSED Aug. 4. DISTRIBUTION.—Mains, 1.7 miles. Taps, 75. Meters, 0. Hydrants, public, 13. FINANCIAL.—Cost, $10,000. No debt. MANAGEMENT.—Rept. by Supt., F. J. Sherrill, Sept. 22, '96.

30. **PORT ANGELES,** Clallam Co. (Est., 3,000.) Built in '91 by Port Angeles Gas & Water Co.; put in operation June 20. FRANCHISE.—20 yrs. from '90. Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay $84 per hydrant per yr. LEGAL DIFFICULTIES.—City attempted to take some of water for power purposes; Co. served injunction and stopped them. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—(In '89.) Cap., 3,000,000 galls. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 8 miles. Taps made by Co. for $10. Services, galv. i.; paid for by consumer. Meters: 6; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for wharves. Hydrants, public, 14. PRESSURE.—Ordinary and fire, 110 lbs. FINANCIAL.—Cost, $74,500. Cap. Stock: Authorized, $150,000; paid-up, $75,000. Bonded debt, $40,000, at 6%; due in 1912. Expenses, $2,800: Operating, $400; int., $2,400. Revenue, City, fire protection, $960. MANAGEMENT.—Prest., C. P. Brown. Rept. by Secy. and Supt., C. E. Mallette, June 9, '96. SEWERS.—Has storm sewers only.

31. **PORT TOWNSEND,** Jefferson Co. (4,558.) Built in '89-90 by Mt. Olympus Water Co. (temporary plant ?). In '92 Co. and city were discussing terms of proposed contract. FRANCHISE.—25 yrs. SUPPLY.—Wells, pumping to reservoir. PUMPS.—Cap., 500,000 galls.; 2—250,000 Dow. Wood used as fuel. RESERVOIR.—Cap., 300,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains: Cost extensions met by revenue and assessments. Taps made by Co. for $2.50. Services, iron; paid for by consumer from curb. Meters owned by Co. and consumers; controlled by Co.; repairs paid by both. Co. cannot compel but may prohibit use of meters. Hydrants, public, 18. CONSUMPTION.—(Galls.) max., 200,000; min., 150,000. PRESSURE.—Ordinary, 65 lbs.; fire, 75 lbs. Steam fire engines are used. FINANCIAL.—Cost (in '90), $73,975. Cap. Stock: Authorized, $750,000. Floating debt, $5,000, at 10%. Expenses: Operating, $3,400; int. and constn., $900. MANAGEMENT.—Prest., John Lillie; Treas., Robt. C. Hill; Supt., John Fulton; Ch. Pump. Engr., B. Green. Rept. by Secy., Nathl. D. Hill, July 10, '96. SEWERS.—None.

32. **PULLMAN,** Whitman Co. (868.) Built in '90 by city; put in operation Dec. 1. Engr., G. W. Horner, Lewiston, Idaho. No Contr. SUPPLY.—One 6-in. x 80-ft. artesian well, by pumping. Water is drawn from well at overflow at ground level on account

of sand, a sand trap being used. PUMPS.—Cap., 740,000 galls.; 240,000 Rumsey; 500,000 Worthington comp. non-cond. Wood used; av. cost, $5 per cord, about ¾ cord used daily. RESERVOIRS.—Cap., 435,000 galls. City: 150,000, giving 65 lbs. pressure; used as reserve. State Agricultural College: 285,000, giving 120 lbs. pressure; city has use under contract expiring Mar., '97; used by college for farm and buildings. DISTRIBUTION.—Mains, 4 miles; cost extensions met by water fund. Taps, 175; made by consumer, fee $2.50 to city. Services, ¾-in.; paid for by consumer. Meters, 0. Use of meters optional with consumer. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 120 lbs.; fire, 160 lbs. FINANCIAL.—Floating debt, $700. Expenses, Operating, $1,440. Revenue, $2,760: Consumers, unmetered, $2,400; State College, $360. Revenue is divided equally between operating expenses and sinking fund. MANAGEMENT.—City Treas., T. B. Miller. Rept. by Supt., C. M. Borland, Sept. 21, '96. SEWERS.—None.

33. **PUYALLUP,** Pierce Co. (1,732.) Puyallup Water & Light Co. incorp. in '86. June, '91, Tacoma Light & Water Co. bought works (selling them in '95, as below). Puyallup Water Co. was to be formed within two months of time rept. was made. Bought by Tacoma Gas & Electric Light Co., May 1, '95; built in '76 by Co. FRANCHISE.—50 yrs. from '91. Rates are not subject to regulation by city. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Springs, pumping direct. PUMPS.—Cap., 1,500,000 galls.; 1,000,000 and 500,000 Worthington, latter a simple high pressure. Wood used. DISTRIBUTION.—Mains, 9 miles; cost extensions met by earnings. Taps made for $5. Services, iron; paid for by consumer. Meters: 2; owned by Co. Use of meters optional with Co.; compulsory for steam plants. Hydrants, public, 3. CONSUMPTION.—(Galls.) av., 280,000; max., 540,000. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—(In '90.) Cost, $75,000. Cap. Stock, $30,000. Bonded debt, $30,000, at 8%. Expenses, $3,000. Revenue, $9,200. MANAGEMENT.—Prest., Edmund Seymour; Secy., W. G. Gaston; Treas., Chas. B. Hurley; Ch. Pump. Engr., D. McBain. Rept. by Co., June 15, '96. PROJECTED IMPROVEMENTS.—Gravity system is in contemplation; work will not begin until Mar., '97. SEWERS.—None.

34. **RITZVILLE,** Adams Co. (Est., 619.) Built by town; put in operation Jan. 1, '95. Engr. —— Cooper; Contr., W. H. White & Co., both of Spokane. SUPPLY.—Wells, pumping to tank. PUMP.—Cap., 36,000 galls.; run by Rider Hot Air Engines. Bituminous coal used; av. cost, $5 per short ton. RESERVOIRS.—Cap., 65,000 galls.; storage. TANK.—Cap., 61,000 galls.; wood, 20 × 26 ft., on wood tower 40 ft. high. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 1 mile; cost extensions met by taxes. Services, galv. i.; paid for by owner. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 10,000. PRESSURE.—Ordinary, 45 lbs. FINANCIAL.—Cost, $6,000. Bonded debt, $5,000, at 8%. MANAGEMENT.—Rept. by Mayor, O. H. Greene, Aug. 25, '96. SEWERS.—None.

35. **ROSLYN,** Kittitas Co. (1,484.) Built in '89 by city. SUPPLY.—Springs, by gravity. June, '93, Supt. rept. an artesian well would soon be connected with system; well gave flow of 40,000 galls. in 24 hrs., when tested. RESERVOIR.—Cap., 900,000 galls. DISTRIBUTION.—Mains (in '89), 1 mile. Hydrants, 17. PRESSURE.—55 lbs. FINANCIAL.—Cost, $10,000. Debt, $3,000 at 10%. Expenses, $200. Revenue, $1,400. NOTE.—No rept. since '90-1 Manual, except regarding well.

D 3. **SEA HAVEN** (P. O. South Bend), Pacific Co. (Not given.) Built in '90 by Thos. Potter. Supply, springs, collected in reservoir by gravity. Reservoir, 150 ft. above and ¾ mile from town. Mains, 1½ miles. Taps, 10. Pressure, 30 lbs.

36. **SEATTLE,** King Co. (42,837.) Two private plants bought by city and improved. First supplied in '82 by Lake Union Water, whose works were bought by city in '91 for $27,500. In '84 Spring Hill Water Co. built works, which were bought in '89 by city for $352,000. SUPPLY.—Lake Washington, pumping to reservoirs and direct, with repumping for high service. Lake is 15 ft. above mean high tide and reservoir is 290 ft. higher. PUMPS.—A 5,000,000 Holly-Gaskill hor. high duty; 2,500,000 Dow comp.; 2—1,500,000 Worthington comp. cond. Pumps located at main and two auxiliary stations. Washed screenings of coal used; av. cost, $1.05 per short ton, delivered at pumping station dock. RESERVOIRS.—Cap., 4,700,000 galls: Pine and 15th Sts., 4,500,000; City Park, 100,000; Queen Anne Station, 100,000. DISTRIBUTION.—Mains, 102½ miles; cost extensions met by appropriations. Taps, 3,500; made by city at $8 for ½-in.; $10 for ¾-in.; $12 for 1-in.; $15 for 1½-in. Services, galv. i., with lead connection; paid for by city to curb, thence by consumer. Meters: 369 and 12 indicators; owned, controlled and repaired by city; yearly rental, $2.50 for ½-in., $3 for ¾-in., to $45 for 6-in. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 493. CONSUMPTION.—(Galls.) av., 5,500,000; max., 7,500,000; min., 4,500,000. PRESSURE.—Ordinary and fire, 80 to 130 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,141,563, including purchase of old works. Bonded debt, $1,160,000: $955,000 at 5%; due in 1910; $205,000 at 5%; due in 1912. Sinking Fund, none. Expenses, $91,987: Operating, $39,487: Int., $52,500. Revenue, $112,000: Consumers, unmetered, $66,000: metered, $46,000. MANAGEMENT.—Rept. by Supt., L. B. Youngs, July 13, '96. PROJECTED IMPROVEMENTS.—Gravity system

from Cedar River; surveys were being made and land acquired at time of rept. SEWERS.—Has sanitary and storm sewers.

24. **SEHOME JUNCTION** (P. O. New Whatcom), Whatcom Co. See New Whatcom.

37. **SHELTON,** Mason Co. (648.) Built in '91 by city; put in operation in Oct. SUPPLY.—Springs, by gravity from two impounding, to distributing reservoir. RESERVOIR.—Cap., 100,000 galls.; distributing. (Cap. of impounding not rept.) DISTRIBUTION.—Mains, 2 miles; cost extensions met by water fund. Taps made by city. Services, iron; paid for by city. Meters, 0. Hydrants, public, 13. PRESSURE.—Ordinary, 66 lbs. FINANCIAL.—Cost, $10,000. Debt, $10,272: Floating, $272. Bonded, $10,000 at 6%. Sinking Fund, none. Expenses, int., $605. Revenue, $1,197: Consumers, $724; saloon licenses, $473. MANAGEMENT.—Mayor, Waldo G. Rex. Rept. by Clk., C. V. Dunbar, Sept. 21, '96. SEWERS.—Has one sanitary sewer.

38. **SNOHOMISH,** Snohomish Co. (1,993.) Built in '92 by city; put in operation June 16. Engr., M. Stixrud, Seattle. Contrs., Cummings & Cook, Aberdeen. SUPPLY.—Well, fed by river, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; 2—500,000 Blake. FILTER.—Cap., 300,000 galls.; sand and gravel. RESERVOIR.—Cap., 500,000 galls.; distributing. DISTRIBUTION.—Mains, 7 miles. Taps, 300. Services, iron; paid for by consumer. City can compel use of meters. Hydrants, public, 53. PRESSURE.—Ordinary, 85 lbs.; fire, 120 lbs. Steam fire engines are used. FINANCIAL.—Cost, $48,000. MANAGEMENT.—Rept. by D. S. Swerdfiger, Jan. 15, '97. SEWERS.—Has sanitary and storm sewers.

D 4. **SOUTH ABERDEEN** (P. O. Aberdeen), Chehalis Co. (Not given.) Built in '91 by Sunset Light & Water Co.; put in operation July 1. Supply, brook, by gravity. Reservoir, cap., 500,000 galls. Mains, 3 miles. Taps, 12. Services, w. i. Pressure, 30 lbs. Cost, $15,000. Cap. Stock, $50,000. No rept. since '90-1 Manual.

39. **SOUTH BEND,** Pacific Co. (Est., 68.) Leased by Mountain Spring Water Co.; built in '92-3 by South Bend Water Co., now in hands of receiver. Mountain Spring Water Co. incorp. in '96, and introduced gravity supply, abandoning old pumping plant. FRANCHISE.—30 yrs. from Apr. 3, '93; provides for purchase of works by city at expiration of 15, 23 or 25 yrs.. price to be appraised. Rates are fixed in franchise. Co. is not exempt from local taxes. Co. was to pay $90 per yr. for each of 25 hydrants; see below. LEGAL DIFFICULTIES.—City did not pay hydrant rentals for some 2 yrs. Receiver sued city. U. S. Circuit Court of Appeals held that hydrant contract was invalid, because when franchise was granted city was in debt above the 1½% constitutional limit, and did not submit the contract to popular vote, as required by law. SUPPLY.—By gravity from point about 2½ miles from and 400 ft. above town, apparently direct to main. DISTRIBUTION.—Mains, 8 miles. Taps, 80; made by Co. or licensed plumber, at expense of consumer. Services, galv. i.; paid for by consumer. Meters, only a few in use and no rules established. Use of meters optional with consumer. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 125 lbs. FINANCIAL.—Cost, $28,000: $23,000 for original works and $5,000 for gravity extension. Cap. Stock (new Co.) authorized: Common, $30,000; Pref'd, $30,000. Debt, $29,650: Old plant, $23,000; new, $6,500. Revenue, Consumers, about $2,500; City, none at present; see above. MANAGEMENT.—Mt. Spring Water Co.: Prest. and Treas., Chas. E. Shepard; Secy., Chester H. Kiehl; both of Seattle; Mgr., Horace Phillips. Rept. by Prest., Mar. 2, '97, supplemented by figures under distribution from Jno. Corkish, Portland, June 11, '96.

40. **SOUTH PRAIRIE,** Pierce Co. (Precinct, 539.) Built by South Prairie Water Co. SUPPLY.—Spring, by gravity to reservoir.

41, 42. **SPOKANE,** Spokane Co. (19,922.)

CITY'S PLANT.

Built in '84 by city. New works were put in service Mar. 1, '96. Engr., J. T. Fanning, Minneapolis. Contr., R. A. Jones, began construction, city completed it. SUPPLY.—Spokane River, tapped 4¾ miles above city, pumping direct. Force main, 24-in., steel. PUMPS.—Cap., 12,000,000 galls.; 4—3,000,000 Holly water-power. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 40 miles; cost extensions met by collections. Taps, 2,200; made by city, no fee. Services, lead; paid for by property owner. Meters: 125; owned, controlled and repaired by city. Use of meters optional with city; compulsory for manufactories, blocks and large consumers. City does not allow meters on domestic services. Hydrants, public, 318. CONSUMPTION.—(Galls.) av., 3,500,000; max., 6,000,000; min., 1,800,000. PRESSURE.—Ordinary, 90 lbs.; fire, 120 lbs. Three steam fire engines are used. FINANCIAL.—Cost, $826,000. Bonded debt, $620,000, at 6¼%. Expenses, Operating, $8,850. Revenue more than pays operating expenses, repairs and int. MANAGEMENT.—Bd. Pub. Wks. Ch. Pump. Engr., F. H. Amsden. Rept. by Supt., Frank Kiser, Aug. 19, '96. PROJECTED IMPROVEMENTS.—A 16,000,000-gall. reservoir; Feb. 5, '97, L. F. Boyd, Cy. Clk., rept. that Cy. Engr., Oskar Huber, had been instructed to prepare plans for a reservoir. SEWERS.—Has sanitary and storm sewers.

LIDGERWOOD WATER-WORKS CO.

Built in '90 to supply suburb; put in operation Apr. 1. SUPPLY.—Artesian well,

pumping to reservoir. PUMP.—Cap., 450,000 galls.; Knowles. RESERVOIR.—Cap., 50,000 galls. DISTRIBUTION.—Mains, 5.5 miles. Taps, 95. Services, galv. i. Hydrants, 12. CONSUMPTION.—(Galls.) av., 25,000. PRESSURE.—Ordinary, 30 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $21,000. No debt. NOTE.—No rept. since '90-1 Manual. After the above was put in type press repts. was received stating that city had bought this plant and was (Mar., '97) about to connect distribution system with city mains.

43. **SPRAGUE,** Lincoln Co. (1,689.) Built in '89 by Sprague Water Co. Press rept., June, '92, stated people had voted to establish works. FRANCHISE.—25 yrs.; provides for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Well, pumping to reservoir and direct. PUMP.—Cap., 720,000 galls.; Knowles comp. dup. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 2.5 miles. Taps, 55. Services, galv. i. Hydrants, 25. CONSUMPTION.—(Galls.) av., 50,000. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $16,153. Cap. Stock: Authorized, $20,000; paid-up, $14,500. Floating debt, $1,649, at 12%. Expenses, $985. Revenue, $1,532: Consumers, $590; City, fire protection, $942. NOTE.—No rept. since '90-1 Manual.

44. **SUMNER,** Pierce Co. (580.) Built in '87 by Spring Branch Water Co. LEGAL DIFFICULTIES.—Town proposed to build. Nov., '93, Town Clk. rept. Co. were denied injunction against city works in Superior Court, but had appealed to Supreme Court. No information as to result, but in Nov., '96, citizen rept. "city does not own any works." SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 87. Hydrants, 2. CONSUMPTION.—(Galls.) av., 43,000. PRESSURE.—(In '89.) 70 lbs. FINANCIAL.—Cost, $7,300. Cap. Stock: Authorized, $10,000; paid-up, $4,000. Debt, $3,250: Floating, $250, at 10%; Bonded, $3,000, at 10%; due Nov. 7, '90. Expenses, $735: Operating, $425; int., $310. Revenue, $1,004. MANAGEMENT.—Prest. (Nov., '96), W. L. Thompson. NOTE. —No rept. since '90-1 Manual, except as noted.

45. **TACOMA,** Pierce Co. (36,006.) Bought by city in '93; built in '85 by Tacoma Light & Water Co. SUPPLY.—Clover Creek and gulch, by gravity and pumping to stand-pipe; also Lake Spanaway when necessary. PUMPS.—Cap., 7,350,000 galls.; six. (Make and cap. not given, but makers rept. 4,000,000 Laidlaw-Dunn-Gordon, furnished in '91; 2—1,000,000 Worthington simple high pressure; and 1,500,000 Holly hor. water motor.) FILTERS.—Located 12 miles from city, used only when Lake Spanaway is drawn upon. Water passes over iron, is aerated and finally passes upward through sand filter bed. Engr., Geo. H. Sellers, Philadelphia. RESERVOIRS.—Cap., 5,300,000 galls.; four. STAND-PIPE.—Cap., 295,000 galls.; steel, 20 × 125 ft. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains: Cost extensions met by surplus revenue of water and light dept. Taps, 3,600; made by city for $8, including service connections. Services paid for by property owner. Meters: 350; owned, controlled and repaired by city; yearly rental, $8. Use of meters compulsory for manufacturers, residence flats and other classified consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 304. CONSUMPTION.—(Galls.) av., 4,535,000; max., 6,800,000; min., 2,732,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—(In '90.) Figures include both water and lighting plants. Cost, $1,500,000. Bonded debt, $1,700,000, at 7%. MANAGEMENT.—Rept. by W. C. Chidester, June 18, '96. SEWERS.—Has sanitary and storm sewers.

46. **TEKOA,** Whitman Co. (301.) Built in '92 by city; put in operation Nov. 1. Engr. and Contr., Geo. H. Sutherland, Walla Walla. SUPPLY.—Artesian well, pumping to reservoir. PUMP.—Cap., 240,000 galls.; Knowles dup. Roslyn coal used; av. cost, $5.50 per short ton. RESERVOIR.—Cap., 150,000 galls.; storage and distributing. DISTRIBUTION.—Taps, 110; made by city plumber, no fee. Services, galv. i.; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 50,000; max., 75,000; min., 35,000. PRESSURE.—Ordinary, 96 lbs. FINANCIAL.—Cost, $15,000. Bonded debt, $13,000, at 6%. No sinking fund. MANAGEMENT.—Rept. by J. L. McDonald. SEWERS.—None.

47. **UNIONTOWN,** Whitman Co. (279.) Built in '92 by city; put in operation Aug. 24. Contr., G. H. Sutherland, Walla Walla. SUPPLY.—Artesian well, pumping to reservoir. PUMP.—Cap., 500,000 galls.; Dean Bros. dup. RESERVOIR.—Cap., 200,000 galls.; elev. 114 ft. DISTRIBUTION.—Mains, 6,100 ft. Taps, 38. Meters, 0. Hydrants, public, 16. PRESSURE.—Ordinary, 54 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $8,000. Debt, $6,000, at 6%. Expenses, Operating, $650. Revenue, City, fire protection, $900. MANAGEMENT.—Rept. by Supt., Henry Hageman, Feb. 1, '97. SEWERS.—None.

D 5, 48. **VANCOUVER,** Clarke Co. (3,545.)

VANCOUVER WATER CO.

Built in '68. Franchise, 25 yrs.; does not provide for purchase of works by city. Rates are fixed in franchise. Supply, springs, by gravity from 500,000-gall. impounding to 500,000 and 30,000 distributing reservoirs. Mains, 17 miles. Taps, 500. Meters, 0. Pressure, 75 lbs. Cap. Stock: Authorized, $45,000; all paid-up; paid 10% div'd in '90. No rept. since '90-1 Manual. Reference, Eng. News, Apr. 8, '82.

COLUMBIA LAND & IMPROVEMENT CO.

Built in '89-91 by Co. SUPPLY.—Deep well, pumping to tank and reservoir. PUMP.—Cap., 500,000 galls.; Dow. TANK.—Cap., 300,000 galls. DISTRIBUTION.—Mains, 16 miles. Hydrants, 3. PRESSURE.—Ordinary, 100 lbs.; fire, 180. FINANCIAL.—Cost, $50,000. Bonded debt, $25,000 at 8%. Expenses, $1,080. Revenue, $1,400. NOTE.—No rept. since '90-1 Manual.

49. **WAITSBURG,** Walla Walla Co. (817.) Built in '92 by city; put in operation Jan. 23. Engrs., Adams & Gemmel; Contrs., Oregon Bridge Co. and E. U. Cummings. SUPPLY.—Filter cribs in or near two streams, by gravity; supplemented by pumping for three months during irrigation season. PUMP.—Cap., 500,000 galls.; Hooker dup. Wood used; av. cost, $3 per cord. RESERVOIR.—Cap., 400,000 galls.; distributing, about 1,500 ft. from business portion of city. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by water rentals. Taps, 100; made by consumer at $8 for ¾-in. and $7 for ½-in. Services, galv. i.; paid for by city to curb line. Hydrants, public, 22. CONSUMPTION.—(Galls.) av., 35,000; max., 100,000; min., 10,000. Water is used principally for irrigating during June, July and August. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $30,000. Debt, $25,000: Floating, $5,000, at 10%; Bonded, $20,000 at 6%; due 1912. Sinking Fund. A tax will be levied for this in '99 and each year thereafter, until sufficient money is raised to pay entire indebtedness. Expenses, $1,950: Operating, $250; int., $1,700. Revenue, Consumers, $1,500. MANAGEMENT.—Supt. and Ch. Pump. Engr., F. McKinney. Rept. by Cy. Clk., I. M. McKinney, June 18, '96. SEWERS.—None.

50. **WALLA WALLA,** Walla Walla Co. (4,709.) Built in '65 by Walla Walla Water Co. LEGAL DIFFICULTIES.—Co. is in litigation with city over contract. Press repts. state: In July, '93, city voted $160,000 bonds for municipal works. Co. sought injunction to prevent building and secured and maintained it in county and state courts, and in U. S. Circuit Court. Sept., '96, case was before U. S. Supreme Court, on appeal. In '96, city refused to pay hydrant rental. SUPPLY.—Springs, by gravity, supplemented by pumping to stand-pipe. PUMP.—Whirlpool centrifugal pump, driven by 6-HP. gasoline engine. RESERVOIRS.—Cap., 2,750,000 galls.; three storage. STAND-PIPE.—Cap., 14,000 galls.; 10 x 25 ft. DISTRIBUTION.—Mains, 21 miles. PRESSURE.—Ordinary, 25 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest. and Supt., W. W. Langdon. Rept. by Secy., Harry H. Turner, Sept. 14, '96.

51. **WATERVILLE,** Douglas Co. (293.) Bought by city in '96; built in '91 by Waterville Improvement Co. Contr., H. K. Owens, Seattle. PUMP.—Cap., 500,000 galls.; Gordon (rept. by makers). FINANCIAL.—Contract price rept. in '91 as $20,000.

P 8. **WENATCHEE,** Kittitas Co. (Not given.) Wenatchee Water Power Co. was refused franchise for works in '96, but hopes to secure one and build works in '97. Engr., M. Stixrud, Seattle. Supply, Wenatchee River, pumping to reservoir. Est. cost, $15,000. Rept. by Prest., Arthur Gunn, July and Dec., '96.

52. **WEST SEATTLE,** King Co. (Est., 1,400.) Built in '90 by West Seattle Land & Improvement Co. SUPPLY.—Springs, pumping to tank. PUMP.—Cameron. TANK.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 4 miles. Services, ¾-in. FINANCIAL.—Cost, $17,500. Cap. Stock, $100,000. No debt. MANAGEMENT.—Prest., Homer S. King; Rept. by Secy. and Mgr., Jas. H. Watson, Sept. 23, '96.

OREGON.

1. **ALBANY,** Linn Co. (3,079.) Built in '80 by J. A. Crawford; sold in '89 to Albany Canal, Water, Transportation & Lighting Co. FRANCHISE.—Does not provide for purchase of works nor control of rates by city. SUPPLY.—Santiam Canal and Calapooya River, pumping direct. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Dow water-power. DISTRIBUTION.—(In '88.) Mains, 3.6 miles. Taps, 200. Meters, 0. Hydrants, 5. FINANCIAL.—Revenue, $100. MANAGEMENT.—Gen. Mgr., Wm. M. Hoag, Corvallis. NOTE.—Above from '89-90 Manual; later information refused.

30. **ALBINA** (Station B, Portland P. O.), Multnomah Co. (5,129.) See Albina Light & Water Co., Portland.

2. **ARLINGTON,** Gilliam Co. (356.) Owned by Co. and city; built in '88 by Arlington Water Co.; in '95 city bought 300 shares of stock. SUPPLY.—Columbia River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Blake. Rock Springs coal used; av. cost, $7.75 per short ton. RESERVOIR.—Cap., 31,000 galls. DISTRIBUTION.—Mains, 2 miles; cost extensions met by cash. Taps, 100; made by Co. Services, 1 to ¾-in.; paid for by consumer. Meters, 0. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 10,000; max., 20,000; min., 2,000. PRESSURE.—Ordinary, 60 lbs. FINANCIAL.—Cost, $7,000. Cap. Stock: authorized, $5,000; all paid-up. Expenses, Operating, $1,200. Revenue, $2,200: Consumers, $1,600; City, fire protection and street sprinkling.

$600. MANAGEMENT.—Mayor; Ch. Pump. Engr., S. Carlisle. Rept. by Secy. and Supt., R. H. Robinson, June 18, '96. PROJECTED IMPROVEMENTS.—Pump-house is to be rebuilt. SEWERS.—None.

3. **ASHLAND,** Jackson Co. (1,784.) Built in '90 by city. SUPPLY.—Mountain Creek, by gravity. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 16 miles; cost extensions met by taxtion. Taps, 375. Services, galv. t.; paid for by consumer. Meters, 0. Hydrants, public, 32. PRESSURE.—Fire, 110 lbs. FINANCIAL.—Cost, $5,600. Expenses, $4,418: Operating, $938; int., $3,480. Revenue, Consumers, $3,460. MANAGEMENT.—Rept. by I. C. Dodge, June 9, '96. SEWERS.—Has very imperfect system of storm sewers only.

4. **ASTORIA,** Clatsop Co. (6,184.) Now owned by city; built in '83-4 by Columbia Water Co. City bought plant July 1, '92, and rebuilt it entirely in '95 and '96. Engr., Arthur L. Adams, San Francisco. SUPPLY.—Bear and Cedar Creeks, by gravity to distributing reservoirs through 7½ miles of 18-in. wood stave conduit, 3 miles of 16-in. and one mile 14-in. steel riveted pipe. RESERVOIRS.—Cap., 6,750,000 galls. Low Service: 500,000; elev., 166 ft. High Service: 6,250,000; elev., 283 ft. DISTRIBUTION.—Mains, 9 miles; cost extensions met by water rentals. Taps, 700; made by city for $2.50, including service complete, with corp. and service cock and box. Services, galv. t.; paid for by property owner. Meters, 0; use of meters optional with city. Hydrants, public, 90. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—Ordinary, 65 lbs.; fire, 113 lbs. One steam fire engine is kept in reserve. FINANCIAL.—Cost, $325,000. Bonded debt, $300,000: $100,000 at 6%; due in 1922; $200,000 at 5%; due in 1925. Sinking Fund is to commence in '97. Expenses, $22,480: Operating, $6,480; int., $16,000. Revenue, Consumers, $25,000. City charter requires rates to be such as to meet all expenses. MANAGEMENT.—Prest., W. W. Parker; Treas., Frank Patton; Supt., Geo A. Shields. Rept. by Clk., H. G. Van Dusen, July 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 22, '84.

5. **ATHENA,** Umatilla Co. (495.) Built in '95 by city for general supply; put in operation in June. SUPPLY.—Well, pumping to tank on 100-ft. tower. FINANCIAL.—Cost, probably about $10,000.

6. **BAKER CITY,** Baker Co. (2,604.) Built in '88-9 by city. SUPPLY.—Artesian wells, pumping to reservoir and direct. PUMP.—(In '89.) Cap., 750,000 galls.; Worthington comp. dup. RESERVOIR.—(In '89.) Cap., 425,000 galls.; 150 ft. above city. DISTRIBUTION.—Mains, 10 miles. Taps, 350. Meters, 49. Hydrants, public, 73. CONSUMPTION.—(Galls.) av., 800,000. PRESSURE.—(In '89.) 65 lbs. FINANCIAL.—Cost, $60,000. Bonded debt, $60,000, at 6%. Expenses, $6,905: Operating, $3,305; int., $3,600. Revenue, $6,275. Deficit of $630, paid from other funds. MANAGEMENT.—Rept. by Supt., O. C. Stern, Sept. 18, '96.

—? **CLATSKANIE,** Columbia Co. (212.) Bought by city in '96 from Mrs. Amanda Merrill. Purchase included spring.

7. **COQUILLE,** Coos Co. (494.) Built in '85-6 by Occident Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. No legal difficulties. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 30,000 galls. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by surplus. Taps, 100; made by Co. free. Services, galv. t.; paid for by property owner. Hydrants, public, 4. FINANCIAL.—Cost, $5,000. Cap. Stock: Authorized, $1,600; all paid-up; paid 10% div'd in '95. Expenses, Operating, $300. No deficits. MANAGEMENT.—Prest., N. Lorens; Secy. and Supt., A. J. Sherwood; Treas., J. A. Collier. Rept. by Co., July 9, '96.

8. **CORVALLIS,** Benton Co. (1,527.) Built in '87 by Corvallis Water Co. FRANCHISE.—15 yrs. from '85. Co. is not exempt from local taxes. City to pay hydrant rental. SUPPLY.—Willamette River, pumping to tanks and direct. PUMPS.—Cap., 1,500,000 galls.; 1,000,000 and 500,000 Worthington, latter a simple high pressure. Wood used. TANKS.—Cap., 60,000 galls.; 2—30,000 redwood. DISTRIBUTION.—Mains, 5 miles; cost extensions met by cash. Taps, 3; made by Co. Services paid for by property owner. Meters: 4; owned and repairs paid by consumer; controlled by Co. Use of meters optional with consumer; compulsory for mills and public buildings. Hydrants, public, 10; cisterns, 7. CONSUMPTION.—(Galls.) av., 200,000; max., 1,000,000; min., 100,000. PRESSURE.—Ordinary, 35 lbs.; fire, 90 lbs. FINANCIAL.—Expenses: Operating, $2,000; taxes, $240. Revenue: City, fire protection, $650; street sprinkling, $80 to $90. MANAGEMENT.—Prest., G. R. Farra; Secy. and Supt., Wm. Groves; Treas., Mrs. Anna Farra. Rept. by Co., June 9, '96. SEWERS.—Has storm sewers only.

9. **COTTAGE GROVE,** Lane Co. (Precinct, 1,527.) Built in '95 by Cottage Grove Water Co.; put in operation in May. Engr. and Contr., H. Orchard, St. Helena. FRANCHISE.—35 yrs. from '95. Rates not fixed in franchise; are subject to regulation by city. Co. is not exempt from local taxes, but receives compensation for public service. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 200,000 galls. DISTRIBUTION.—Mains, 1¼ miles; cost extensions met by revenue. Taps, 40; made by Co. for $1. Services paid for by consumer. Meters, 0. Hydrants, public, 8. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $3,750. Cap. Stock: Authorized, $3,500; all

paid-up; paid 8% div'd in '95. No debt. Expenses: Operating, nominal. Revenue, 8 to 10% on investment. MANAGEMENT.—Prest., D. G. McFarland; Secy. and Treas., J. W. Gowdy. Rept. by J. P. Currin, Aug. 26, '96. SEWERS.—None.

—? **EAST COTTAGE GROVE** (P. O. Cottage Grove?), Lane Co. (Not given.) Press rept., Aug., '94, stated town had let contract for works to H. Orchard, Portland. Jan., '97, citizen of Cottage Grove rept.: "Works on east side owned by city; those on west side owned by Cottage Grove Water Co." (See Cottage Grove.)

10. **ENTERPRISE,** Wallowa Co. (242.) Built in '90 by Enterprise Water Co.; put in operation Oct. 1. FRANCHISE.—20 yrs. SUPPLY.—Wallowa River, pumping to reservoir and direct. PUMPS.—Cap., 700,000 galls.; Holly hor. water-power. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Hydrants, 6. FINANCIAL.—Cost, $8,500. Cap. Stock: authorized, $10,000; paid-up, $5,000. Debt, $3,000. Expenses, nominal. Hydrant rental, $100. NOTE.—No rept. since '90-1 Manual.

11. **EUGENE,** Lane Co. (Est., 3,958.) Built in '86 by Eugene Water Co. FRANCHISE.—Exclusive. SUPPLY.—Willamette River, pumping to reservoir and direct. PUMPS.—Cap., 2,500,000 (?) galls.: 2—500,000 Dow rept. in '89; 1,500,000 Worthington comp. non-cond. rept by makers (press rept. states this was added in '92). RESERVOIR.—Cap., 250,000 galls. DISTRIBUTION.—(In '88.) Mains, 12 miles. Hydrants, 27. CONSUMPTION.—(Galls.) av., 170,000. PRESSURE.—(In '89.) Ordinary, 73 lbs.; fire, 260 lbs. FINANCIAL.—(In '88.) No debt. Expenses, $1,700. Revenue, City, $1,000. NOTE.—No rept. since '90-1 Manual.

12. **FOREST GROVE,** Washington Co. (668.) Built in '96 by city; put in operation June 1. SUPPLY.—River, pumping to tank and direct. PUMP.—Cap., 250,000 galls.; Buffalo. Wood used. TANK.—Cap., 83,000 galls. DISTRIBUTION.—Mains, 2 miles; cost extensions met by city from revenue. Taps, 80; made by city. Services, galv. i.; paid for by city. City cannot compel but may prohibit use of meters. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 60,000; max., 100,000; min., 25,000. PRESSURE.—Ordinary, 60 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $27,000. Bonded debt, $27,000, at 6%; due in 20 yrs. Sinking Fund, $1,500. Expenses, $2,100: Operating, $480; int., $1,620. MANAGEMENT.—Ch. Pump. Engr., Gus. Hartrampf. Rept. by Aaron Wells, Cy. Recorder, July 29, '96. SEWERS.—None.

13. **GRANTS PASS,** Josephine Co. (1,432.) Built in '90-1 by Grants Pass Water, Light & Power Co.; put in operation Feb. 1. FRANCHISE.—50 yrs. SUPPLY.—Rogue River, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; Dow, water-power, with steam reserve. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 7.5 miles. Hydrants, 15. PRESSURE.—100 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock, authorized, $30,000; all paid-up. Debt, $45,000: Floating, $15,000; Bonded, $30,000 at 7%. Hydrant rental, $96. NOTE.—No rept. since '90-1 Manual.

14. **HEPPNER,** Morrow Co. (675.) Built in '92 by Heppner Light & Water Co. (see below.) Engr. and Contr., H. V. Gates, Hillsboro. FRANCHISE.—15 yrs. from '92; provides for optional purchase of works by city. Rates not fixed in franchise; are subject to regulation by city. Co. is exempt from local taxes and receives compensation for public service. No legal difficulties. SUPPLY.—Artesian well, pumping to reservoir at elev. of 190 ft. PUMP.—Russell. Wood used. RESERVOIRS.—Cap., 550,000 galls.: 2—250,000, and 50,000. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 3 miles. Taps made by Co. for $6. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 10. FINANCIAL.—Cost, $22,000. Bonded debt, $20,000, at 6%, due 1912. Sinking Fund, none. Plant is subsidized by city to amount of $15,000; $5,000 additional for well. Revenue: $840, from city for water and arc lights. MANAGEMENT.—Rept by F. J. Hallock, Recr., July 1, '96. SEWERS.—None.

15. **HILLSBORO,** Washington Co. (Est., 1,246.) Absorbed in '98 by Hilsboro Electric Light & Water Co.; built in '91 by Hillsboro Light & Water Co.; put in operation Dec. 1. Engr., H. V. Gates. FRANCHISE.—10 yrs. from '91; provides for purchase of works by city after 10 yrs. Rates are fixed by contract and subject to regulation by city. City to pay $800 per yr. for 20 hydrants. No legal difficulties. SUPPLY.—Four driven wells, pumping to tanks and direct. PUMPS.—Cap., 1,000,000 galls.; Buffalo dup. Wood used; av. cost, $1.25 per cord. TANKS.—Cap., 70,000 galls.; 2—35,000, on 105-ft. trestle. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 8 miles; cost extensions met by revenue from works. Taps, 110; made by Co. for $4. Services, ¾-in.; paid for by consumer. Meters, 0; yearly rental, $1.00. Co. can compel use of meters and any consumer may have one. Hydrants, public, 20. PRESSURE.—Ordinary, 43 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $34,000. Cap. Stock: Common, authorized, $24,000, all paid-up; paid no div'd in '95. Floating debt, $3,000. MANAGEMENT.—Secy., Geo. Schulmench; Rept. by Prest. and Supt., H. V. Gates, Aug. 18, '96. SEWERS.—None.

D 1. **HOOD RIVER,** Wasco Co. (201.) Built in '83 by E. F. & H. C. Coe, under name of Hood River Hydrant Co. Press rept., Jan., '94, stated owners had incorp. under name given, with authorized cap. stock of $20,000; also that Hood River Spring Water Co. was incorp. in '95, with cap. stock of $12,000, by S. and N. Blower and W. M. Yates. Franchise does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. Supply, spring, 150 ft. above vil-

lage, by gravity. Mains, 1.5 miles. Taps, 40. Cost, $2,350. No debt. Expenses, nominal. Revenue, $750. No official rept. since '90-1 Manual. Reference, Eng. News, Aug. 16, '84.

16. **INDEPENDENCE,** Polk Co. (Est., 1,000.) Built in '88. Owned by L. C. Gilmore. In '91 works were for domestic use only. FRANCHISE.—20 yrs. from '90. Co. is not exempt from local taxes. City to pay $60 per hydrant per yr. No legal difficulties. SUPPLY.—Gang well system, pumping to elevated tank and direct. PUMP.—Cap., 500,000 galls.; Worthington comp. non-cond. Fir wood used; av. cost, $2 per cord. TANK.—Cap., 20,000 galls.; redwood, 12 × 18 ft., on fir trestle 24 × 60 ft. DISTRIBUTION.—Hydrants, public, 10; private, 4. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 85 lbs.; fire, 80 lbs. FINANCIAL.—Cost, about $20,000. Bonded debt, $7,500, at 10%; due on demand. Expenses: Operating, $720; taxes, $140. Revenue, $3,840: Consumers, $2,880; City, fire protection, $600; street sprinkling, $360. MANAGEMENT.—Rept. by L. C. Gilmore, owner, June 26, '96. SEWERS.—None.

17. **JOSEPH,** Wallowa Co. (249.) Built in '89 by Joseph Water Co. FRANCHISE.—Gives city first option for purchase of works. Rates are not controlled by city. SUPPLY.—Lake, by gravity. DISTRIBUTION.—Mains, 2 miles. Taps, 40. Hydrants, 7. PRESSURE.—(In '89.) 65 lbs. FINANCIAL.—Cost, $4,200. Cap. Stock, $3,000; paid 18% div'd in '90. No debt. Expenses, $230: Operating, $200; taxes, $30. Revenue, City, $250. NOTE.—No rept. since '90-1 Manual.

18. **KLAMATH FALLS,** Klamath Co. (Est., 864.) Built in '95 by Klamath Falls Light & Water Co.; put in operation Dec. 1. Engr., H. V. Gates, Hillsboro. No Contr. FRANCHISE.—10 yrs. from '96; provides for purchase of works by city after 10 yrs.; city failing to do so, franchise is to be extended. Rates are fixed in franchise. Co. is exempt from local taxes to the amount of $10,000, but receives no compensation for public service. Cy. Recorder, C. L. Parrish, rept. June 13, '96, that city gave Co. $10,000 bonds as advance payment for fire protection in 20 yrs. SUPPLY.—Spring, daily flow of 10,000,000 galls., pumping to reservoir. PUMP.—Cap., 216,000 galls.; Dow, water power. RESERVOIR.—Cap., 250,000 galls.; 190 ft. above main street. FISCAL YEAR CLOSED Sept. 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by income. Taps made for $6. Services, ½-in. w. i.; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 10. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $17,000. Cap. Stock: Authorized, $2,000; all paid-up; paid no div'd in '95. No debt. Expenses: Operating, $1,200. MANAGEMENT.—Prest. and Supt., H. V. Gates, Hillsboro; Secy. and Treas., Geo. T. Baldwin. Rept. by Prest. and Supt., Oct. 31, '96. SEWERS.—None.

19, 20. **LA GRANDE,** Union Co. (2,583.)

CITY PLANT.

Built in '92; put in operation Oct. 27. Engr., A. Fillbrick. Contrs., Cuming & Cook, Snohomish, Wash. SUPPLY.—Well, by pumping, and during half the year mountain stream, by gravity. PUMP.—Cap., 1,100,000 galls.; Deane comp. dup. Wood used; av. cost, $2.25 per cord. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 7¼ miles; cost extensions met by water fund. Taps, 200; made by city for $2.50. Services, ¾-in. galv. i.; paid for by city to curb. Meters: 9; owned, controlled, and repaired by city; yearly rental, 10% of cost. Use of meters optional with city; compulsory for livery barns and motors. Hydrants, public, 45. CONSUMPTION.—(Galls.) av., 250,000. PRESSURE.—Ordinary, 95 lbs.; fire, 70 lbs. FINANCIAL.—Cost, $60,000. Bonded debt, $50,000 at 6%. Sinking Fund, none. Expenses, $4,700: Operating, $1,700; int., $3,000. Revenue, $2,680: Consumers, unmetered, $2,200; metered, $480. Deficits and int. are met by general taxation. MANAGEMENT.—Mayor, Wm. Miller; Recorder, H. T. Williams; City Treas., Wm. Grant. Rept. by Supt., F. E. Enloe, June 7, '96. SEWERS.—None.

LA GRANDE WATER CO.

Built in '87. SUPPLY.—Mill Creek, by gravity. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—(In '88.) Mains, 4 miles. Taps, 200. Meters, 0. Hydrants, 10. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—(In '89.) 70 lbs. FINANCIAL.—(In '88.) Cost, $15,000. Cap. Stock, $20,000. No debt. Revenue, $4,600: Consumers, $4,000; City, $600. NOTE.—No rept. since '90-1 Manual.

21. **LEBANON,** Linn Co. (829.) Bought by J. S. & J. B. Hughes, July 1, '96; built in '93. FRANCHISE.—15 yrs. from '93; granted on condition of sufficient supply for fire protection with pressure of not less than 60 lbs. SUPPLY.—Santiam River, pumping to tank and direct. PUMP.—Cap., 1,000,000 galls.; Brandt water power. TANK.—Cap., 15,000 galls.; on wooden trestle 98 ft. high. DISTRIBUTION.—Mains, 1½ miles. Taps made by property owner, no fee. Services, iron; paid for by consumer or property owner. CONSUMPTION.—(Galls.) max., 150,000; min., 7,000. PRESSURE.—Ordinary, 40 lbs.; fire, 60 to 100 lbs. FINANCIAL.—Cost, $19,500. Revenue, $2,600: Consumers, $2,000; City, fire protection, $600. MANAGEMENT.—Ch. Pump. Engr., F. S. Price. Rept. by Supt., J. S. Hughes, Jan. 14, '97. PROJECTED IMPROVEMENTS.—One mile of mains and 30,000-gall. tank to be put in before Apr., '97.

22. **M'MINNVILLE.** Yamhill Co. (1,368.) Built in '89 by city. SUPPLY.—Yam

Hill River, pumping direct. PUMPS.—Cap., 1,300,000 galls.; 2—650,000 Hall dup. DISTRIBUTION.—Mains, 2 miles. Taps, 120. Hydrants, 16. FINANCIAL.—Cost, $23,000. Bonded debt, $20,000 at 6%, due 1909. Expenses, $4,000. Revenue, $840. NOTE.—No rept. since '90-1 Manual.

23. **MEDFORD,** Jackson Co. (967.) Built in '89 by city. SUPPLY.—Bear Creek, by gravity through canal to pumps, then pumping to tank and direct. PUMP.—Cap., 240,000 galls.; Buffalo dup. Wood used; av. cost, $2.94 per cord. TANK.—Cap., 45,000 galls.; wood, 22 × 16 ft., on timber trestle 80 ft. high. DISTRIBUTION.—Mains, 7¼ miles; cost extensions met by city tax. Taps, 169; made by consumer for $2.50. Services, galv. i.; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 280,000; max., 400,000; min., 80,000. More water is used for irrigation than for other purposes. PRESSURE.—Ordinary, 40 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $15,900. Bonded debt, $24,000: $12,000 at 7%; due in 14 yrs.; $9,000 at 7%; due in 4 yrs.; $3,000 at 8%. Expenses, $1,996: Operating, $1,200; int., $796. Revenue, two railways, $360; public buildings, $450. No deficits for last two years; when any occurs it is met by general taxation. MANAGEMENT.—Rept. by Supt. and Pump. Engr., E. W. Cardes, Aug. 15, '96. SEWERS.—Has storm sewers only.

24. **MILTON,** Umatilla Co. (544.) Built in '88 by town. SUPPLY.—Walla Walla River, by gravity from small infiltration reservoir on bank. FISCAL YEAR CLOSED Dec. 19, '95. DISTRIBUTION.—Mains, 2½ miles. Taps, made by city for $1. Services, iron; paid for by city to curb. Meters, 0. Use of meters not optional with city. Hydrants, public, 10. PRESSURE.—(In '89.) 40 lbs. FINANCIAL.—Cost about, $10,000. Expenses, $1,111: Operating, $361; int., $750. Revenue, Consumers, $863. Deficits paid by general fund. MANAGEMENT.—Rept. by Jas. W. Dykes, Aug. 12, '96.

25. **MONMOUTH,** Polk Co. (Est., 413.) Built since '90 by Monmouth Water Co. FRANCHISE.—Was for 20 yrs. Co. having failed to comply with specifications, franchise has been forfeited. Several meetings of taxpayers have been held for the purpose of amending charter to enable bonding of town to make the necessary improvements. SUPPLY.—Well (inadequate), pumping to tank and direct. Wood used; av. cost, $2 per cord. TANK.—Cap., 10,000 galls.; wood, enclosed in timber tower 40 ft. high. DISTRIBUTION.—Mains, about 1 mile. Taps, 20; made by Co., free. Services paid for by consumer. PRESSURE.—Ordinary, 20 lbs. FINANCIAL.—Cost, $10,000 (?). Expenses, Operating, $300. Revenue, Consumers, $200. MANAGEMENT.—Prest., F. Powell; Secy. and Treas., L. Growney. Rept. by Supt. and Pump. Engr., T. J. Berry, Jan. 19, '97. PROJECTED IMPROVEMENTS.—Three or four more wells, 100 ft. above av. level of town; supply to be by gravity, with pumping in case of fire.

26. **MOUNT TABOR,** Multnomah Co. (Precinct, 318.) Mount Tabor Light & Water Co. and Mount Tabor Villa Water Co. built works in '91; former was for domestic supply, and latter not described. Rept. by citizen, Jan., '97, indicated that only Mount Tabor Light & Water Co. was then in existence. Aug., '96, D. Bartholomew, Portland, rept. that small plant built by Kinzel Park Water Co. to supply portion of Portland had been sold to Mount Tabor Light & Water Co.

P 1. **NEWBERG,** Yamhill Co. (514.) Bids for building works were to be received Mar. 18, '97. Engr., Sidney Smith, Oregon City. Supply, mountain springs, by gravity, with tank or reservoir of wood. Est. cost, $15,000. Bonds sold. Cy. Recorder, J. G. Holley. Rept. by Mayor, H. J. Littlefield, Mar. 17, '97.

27. **OREGON CITY,** Clackamas Co. (3,062.) Built in '86 by city. SUPPLY.—Willamette River, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000. RESERVOIRS.—Cap., 1,300,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps made by city. Services, ¾-in. galv. i.; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 50. CONSUMPTION.—(Galls.) av., 1,000,000. PRESSURE.—Ordinary, 80 to 200 lbs. FINANCIAL.—Revenue, Consumers, $6,000. MANAGEMENT.—Rept. by Supt., W. H. Howell.

28. **PENDLETON,** Umatilla Co. (2,506.) Built in '87 by town. SUPPLY.—Well, pumping to reservoir. PUMPS.—Cap., 1,000,000 galls.; 750,000 Blake comp. dup., 250,000 Dow. RESERVOIR.—Cap., 500,000 galls.; 180 ft. above city. DISTRIBUTION.—Mains, 11 miles. Taps, 448. Meters, 1. Hydrants, 27. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 6%. NOTE.—No rept. since '90-1 Manual.

29, 30, 31. **PORTLAND,** Multnomah Co. (46,385 + 15,661, annexed since '90.) Supplied by one municipal and two small private plants. First works built in '53 by Portland Water Co., and bought by city, Jan. 1, '87, for $461,672. In '81-2, East Portland Water Co. built works to supply town of East Portland; town was annexed to Portland on July 1, '91, and in Jan., '97, city bought out Co. for $45,000. May 20, '91, town of East Portland bought out East Side Water Co., whose works were then under construction, paying 10% in addition to actual expenditures of Co., the total amounting to $95,889, and assuming payment of uncompleted contracts, amounting to some $100,000. Mains of the two East Portland plants are now supplied by gravity from main city works. Albina was also annexed to Portland, July 1, '91. See Albina Light & Water Co. and Portland Heights Water Co., below. Regarding Kinzel Park Water Co., see Mt. Tabor.

CITY WORKS.

Built by three Cos. and bought by city, as above. New gravity system put in operation Jan. 1, '95; Engr., Isaac W. Smith. SUPPLY.—Bull Run, a mountain stream, flowing from Cascade Range, by gravity through main 24 miles long to Mt. Tabor reservoir on east side Willamette River, thence crossing river by a submerged pipe, 2,006 ft. long, to two City Park reservoirs. SUPPLY MAIN.—Steel, 42, 35 and 33 ins. in diam., 24 miles long. PUMPS.—500,000 and 1,000,000 Fraser & Chalmers, operated by Pelton water wheels, supplying high service system at elev. of 600 to 650 ft. above reservoir level. Wheels are driven by 62-ft. head of water on pipe line between two reservoirs. RESERVOIRS.—Cap., 66,600,000 galls. Distributing: No. 1, 12,000,000; No. 2, 20,500,000; No. 3, 16,400,000; No. 4, 17,700,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 124 miles; cost extensions met by revenue. Taps, 11,110; made by city for $1 and $2. Services, galv. i.; paid for by property owner. Meters: 210; owned, controlled and repaired by city. Use of meters optional with city; compulsory for laundries, schools, breweries and elevators. Hydrants, public, 428; private, 51. CONSUMPTION.—(Galls.) av., 16,000,000. Present gravity supply, 24,000,000; no restriction on consumption. PRESSURE.—Ordinary and fire, 85 lbs. Steam fire engines are used. FINANCIAL.—Cost, $3,814,508. Bonded debt, $2,900,000: $700,000 at 5%, due in 1917; $2,200,000 at 5%, due in 1923. Sinking fund is soon to be established. Expenses: Operating, $38,939; int., $145,000. Revenue, $235,967. No taxation. MANAGEMENT.—Chn. Water Comrs., Henry Failing; Secy., Frank T. Dodge; Treas., C. H. Lewis; Prin. Asst. Engr., D. D. Clark. Rept. by Ch. Engr. and Gen. Supt., Isaac W. Smith, July 1, '96 (Mr. Smith died Jan. 1, '97). SEWERS.—Has combined sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 21, '83; new reservoir, Nov. 15, '94; asphalt reservoir lining, June 11, '96; new gravity supply, Dec. 24, '96 (under "Notes of a Transcontinental Trip").

ALBINA LIGHT & WATER CO.

Incorp. and bought out Albina Water Co. for $20,000 in '90; works built by latter Co. '87-90. FRANCHISE.—10 yrs. SUPPLY.—Driven wells, pumping to tank and direct. PUMPS.—Cap., 3,500,000 galls.; 2—750,000 simple high pressure and 2,000,000 comp. noncond. Worthington. TANK.—(In '90) Cap., 100,000 galls. DISTRIBUTION.—Taps, 1,500. Hydrants, public, 36. CONSUMPTION.—(Galls.) av., 1,200,000. PRESSURE.—95 lbs. FINANCIAL.—Cost, $136,000. MANAGEMENT.—Rept. by Prest., Geo. W. Bates, Dec. 29, '96.

PORTLAND HEIGHTS WATER CO.

Put in operation Jan. 1, '92, for general use. SUPPLY.—City mains, pumping to tanks. TANKS.—Cap., 100,000 galls.; 2—50,000; one at 600, other at 800 ft. elev. FINANCIAL.—Cost, about $14,000. MANAGEMENT.—Prest., A. T. Smith; Secy. and Treas., Geo. P. Lent. Rept. by citizen, Aug. 6, '96.

82. **ROSEBURGH,** Douglas Co. (1,472.) Built in '89 by Roseburgh Water Co. FRANCHISE.—30 yrs., exclusive; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Umpqua River, pumping direct and to reservoirs. PUMPS.—400,000-gall. Dow water power, in ordinary use; Hall, comp. dup. steam, 7 × 12 × 8 × 12, in case of emergency. RESERVOIRS.—Cap., 600,000 galls.; two. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7.3 miles. Taps, 210. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—(In '89) 180 lbs. FINANCIAL.—Cost, $28,500. Cap. Stock, $20,000; paid 6% div'd in '95. Floating debt, $2,500, at 8%. Expenses, $1,400: Operating, $1,200; taxes, $200. Revenue, $4,200: Consumers, $3,600; City, fire protection, $600. MANAGEMENT.—Prest., T. R. Sheridan; Secy., S. W. Hamilton. Treas., J. P. Sheridan; Supt., O. L. Willis.

83. **SAINT HELEN,** Columbia Co. (220.) Transferred to St. Helen's Light & Water Co. in '96; built in '93 by St. Helen's Water Co. Engr. and Contr., D. J. Switzer. FRANCHISE.—30 yrs. from '93. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Springs, impounded by dam. TANKS.—Cap., 4,000 galls.; 1,500 and 2,500. FISCAL YEAR CLOSED Apr. 1. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by proceeds of plant. Taps, 80. Services, galv. i.; paid for by property owner. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 2,000; max., 3,000; min., 1,500. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $9,000. Cap. Stock: Common, authorized, $9,000; all paid up; paid 8% div'd in '95. No debt. Expenses, $270: Operating, $250; taxes, $20. Revenue: City, fire protection, $200; public buildings, $36. MANAGEMENT.—Prest., D. J. Switzer; Secy., H. Orchard. Rept. by Prest., Aug. 31, '96. SEWERS.—None.

D 2. **SAINT JOHNS,** Multnomah Co. (310.) Owned by J. C. Scott; built about '92. Supply, well, pumping to tank. Cost, $3,000 (press rept. states plant was sold in '93 for $5,000). Rept. by F. K. Miller, Oct., '96.

34. **SALEM,** Marion Co. (10,470, including parts of East, North and South Salem precincts, outside of city limits.) Built in '71 by Salem Water Co. FRANCHISE.—30 yrs. from '92. Co. is not exempt from local taxes. City to pay $21.84 per hydrant per yr. No legal difficulties. SUPPLY.—Willamette River, pumping direct (or to

reservoir?). PUMPS.—Cap., 8,000,000 galls. Three Dow: steam, 2,000,000; water power, 2,000,000 and 4,000,000. Wood used; av. cost, $2 per cord. RESERVOIRS.—Distributing, 176 ft. above street level, located one mile south of works. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 30 miles; cost extensions met by surplus earnings. Taps, 1,000; made by Co. for $1 and $2. Services, galv. i.; paid for by property owner. Meters, 6; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for manufactories and public buildings. Hydrants, public, 64; private, 6. CONSUMPTION.—(Galls.) av., 2,500,000. PRESSURE.—Ordinary, 75 lbs.; fire, 80 lbs. Two steam fire engines are held in reserve. FINANCIAL.—Cost, $290,000. Cap. Stock: Authorized, $90,000; all paid-up; paid no div'd in '95. Bonded debt, $125,000 at 6%. Sinking Fund, none. Expenses, Operating, $7,000. Revenue, $22,000. Surplus earnings are used in improvement of plant. MANAGEMENT.—Prest., J. M. Wallace; Secy., Chas. A. Park. Rept. by Supt. and Ch. Pump. Engr., A. L. Brown, June 8, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 25, '82.

35. **SCIO,** Linn Co. (253.) Bought by city Apr. 2, '94; press rept. states city paid G. M. Coffey $2,150 for plant. SUPPLY.—Creek and springs, pumping from cistern to tank. PUMP.—Run by water power from grist mill. Press rept. states contract is for 20 yrs. from '94, at $15 per month. TANK.—Cap., 6,000 galls.; zinc, on tower. FISCAL YEAR CLOSED Apr. 2. DISTRIBUTION.—Mains, about ½ mile; cost extensions met by taxation or licenses. Taps, made by city, free. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters not optional with city. Hydrants, public, 6. FINANCIAL.—Cost, about $2,000. Floating debt, $800 at 8%. No bonds. Light and water plants are owned and operated in common by city. Income from consumers pays all expenses. MANAGEMENT.—Supt., A. W. Hagey. Rept. by R. Shelton, Oct. 20, '96. SEWERS.—None.

36. **THE DALLES,** Wasco Co. (Est., 3,015.) Bought in '90 by city for $47,000; built in '62 by Robt. Pentland; afterwards owned by Dalles Mill & Water Co.; and extended in '91. SUPPLY.—Hood River, by gravity. RESERVOIR.—Cap., 2,600,000 galls. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 25 miles; cost extensions met by revenue. Taps, made by consumer, no fee. Services, brass (?); paid for by consumer. Meters: 22; owned, controlled and repaired by city. Use of meters optional with city; compulsory for those using 200,000 galls. or more monthly. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 900,000; max., 1,000,000; min., 600,000. PRESSURE.—Ordinary and fire, 90 lbs. One steam fire engine is used. FINANCIAL.—Bonded debt, $105,000, at 6%: $5,000 due in '97; $25,000 due in 1906; $25,000 due in 1901; $25,000 due 1911; $25,000 due in 1916. Sinking Fund: $2,000; invested at 6%. Expenses: Operating, $1,680. No deficits. MANAGEMENT.—Prest., T. A. Ward; Supt., I. J. Norman. Rept. by Secy., Hugh Chrisman, June 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Engr. News, Apr. 15, '82.

P 2. **TILLAMOOK,** Tillamook Co. (Est., 760.) Press repts. latter part of '96 stated council had voted to grant franchise to H. Orchard, who was to put in gravity works.

—? **TREMONT,** Multnomah Co. (Not given.) Built in '92; now owned by A. Franke. Engr. and Contr., Wm. Mellien. SUPPLY.—Well, pumping to tank. TANK.—Wood, lined with galv. i. DISTRIBUTION.—Mains, 1½ miles. MANAGEMENT.—Rept. by D. Long, June 20, '96.

37. **WESTON,** Umatilla Co. (568.) Built in '89 by town. SUPPLY.—Large springs in gravel, by gravity. RESERVOIR.—Cap., 100,000 galls.; impounding. DISTRIBUTION.—Mains, 8 miles; cost extensions met by rentals. Taps, 93; made by city. Services, iron; paid for by property owner. Meters, 0. Hydrants, public, 14. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Bonded debt, $10,000 at 8%. Expenses, $950: Operating, $150; int., $800. Revenue, $1,000. MANAGEMENT.—Rept. by Supt., Ed. Logan. SEWERS.—None

—**WOODBURN,** Marion Co. (405.) Built in '90-1 by D. L. Remington & Son; put in operation in Mar. Co. afterwards shut down works and sold material. Works may be rebuilt, as there has been a change in charter of city. If so, it will be owned and operated entirely by the city. Rept. by D. L. Remington & Sons, July 13, '96.

D 3. **WOODLAWN,** Multnomah Co. (Not given.) Built in '90 by Woodlawn Land Co. for domestic use only. Supply, well, lifted by Knowles pump to 50,000-gall. tank. Mains, 3 miles. Taps, 50. Services, galv. i. Pressure, 25 lbs. Cost, $10,000. No rept. since '90-1 Manual.

CALIFORNIA.*

1. **ALAMEDA AND FITCHBURG** (P. O. Alameda), Alameda Co. (Alameda, 11,165; Fitchburg, not given.) Built in '75 by R. R. Thompson. State law does away with necessity of a franchise. Co. is not exempt from local taxes. City to pay for street

*Water rates in this state are established annually by County Boards of Supervisors or municipal authorities. Some works, however, were built before the constitution was amended to this effect.

sprinkling and sewer flushing. No legal difficulties. SUPPLY.—Artesian wells, at Fitchburg, four miles from Alameda, pumping to stand-pipe and direct. PUMPS.—Cap., 3,000,000 (?) galls.; 1,500,000 Worthington comp. cond.; 1,500,000 Blake. Makers also rept. 2,000-gall. Worthington comp. cond. Welsh anthracite coal used; av. cost, $7 per short ton. STAND-PIPE.—Cap., 250,000 galls.; iron, at elevation of 80 ft.; 210 ft. above pumps. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 57 miles; cost extensions met by cash. Taps, 2,500; made by Co. for $10. Services, ¾-in. galv. i.; paid for by Co. Meters: 2,500; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for all consumers. Hydrants, public, 250. CONSUMPTION.—(Galls.) av., 600,000; max., 1,250,000; min., 300,000. PRESSURE.—Ordinary, 85 lbs.; fire, 65 lbs. One steam fire engine is used. FINANCIAL.—Cost, $534,000. Expenses, $27,500: Operating, $22,500; taxes, $5,000. MANAGEMENT.—Owner, R. R. Thompson; Ch. Pump. Engr., H. W. Kirman. Rept. by Secy. and Supt., I. L. Borden, Aug. 29, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, May 18, '82.

2. **ANAHEIM,** Orange Co. (1,273.) Built in '78 by town. SUPPLY.—Driven wells, pumping to tanks and direct. PUMP.—Cap., 500,000 galls.; Worthington. Bituminous coal and crude oil used. TANKS.—Cap., 215,000 galls.; three of wood, 140,000 galls.; one of steel, 75,000 galls.; all erected on towers at elev. of 65 to 75 ft. above general level and in central part of town. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by general fund in case of small extensions; proposed large extensions, to cost $11,000, by bonds. Taps, 85; made by city at nominal charge. Services, w. i.; paid for by consumer. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 100,000; max., 250,000; min., 80,000. PRESSURE.—Ordinary, 85 lbs.; fire, 100 lbs. FINANCIAL.—No debt. City adjusts rates so that revenue will approximately just cover operating expenses. MANAGEMENT.—Ch. Pump. Engr., Jos. Des Granges. Rept. by Cy. Engr., Chas. S. Rogers, July 28, '96. PROJECTED IMPROVEMENTS.—Old riveted pipe to be replaced by cast iron, about 2½ miles long; election was to be held Aug. 1 to vote bonds. SEWERS.—None.

3. **ANDERSON,** Shasta Co. (508.) Built in '87-8 by Anderson Water Co. SUPPLY.—Mountain stream, by gravity from impounding to distributing reservoir. RESERVOIRS.—Cap., 13,250,000 galls.: Impounding; cap., 18,000,000; area, 10 acres; distributing; 250,000. FISCAL YEAR CLOSED July 24. DISTRIBUTION.—Mains, 1.5 miles. Taps, 80. Hydrants, public, 5. FINANCIAL.—Cost, $10,000. Cap. Stock: Authorised, $10,000; paid-up, $7,580. No debt. Expenses, Operating, $250. MANAGEMENT.—Prest., L. C. Frisbie; Treas., Jas. F. Bedford. Rept. by Secy., C. M. Palmer, Sept. 19, '96.

4. **ANTIOCH,** Contra Costa Co. (635.) Built in '76 by M. W. Belshaw. SUPPLY.—San Joaquin River, pumping to tanks. PUMP.—Cap., 480,000 galls.; Evans comp. Av. cost of coal used, $2.75 per short ton. TANKS.—Cap., 100,000 galls.; two, 50,000; redwood; 24 × 16 ft., on pine trestle 60 ft. above river. DISTRIBUTION.—Mains, 4½ miles. Taps, 250; made by Co., no fee. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 80,000; max., 100,000; min., 50,000. PRESSURE.—Ordinary and fire, 25 lbs. FINANCIAL.—Est. cost, $8,000. Expenses, $2,640: Operating, $2,400; taxes, $240. Revenue, street sprinkling, $150. MANAGEMENT.—Owner, M. W. Belshaw. Rept. by Supt., C. M. Belshaw, July 19, '96. SEWERS.—None.

5. **ARCATA,** Humboldt Co. (962.) Built by Union Water Co. SUPPLY.—Springs, by gravity. DISTRIBUTION.—Mains, ¾ mile. Hydrants, 16. PRESSURE.—50 to 60 lbs. FINANCIAL.—Cost, $12,000. Revenue, City, $300. NOTE.—No rept. since '90-1 Manual.

6. **ARCH BEACH** (P. O. El Toro), Orange Co. (Not given.) Now owned by L. N. Brooks, of Laguna Beach; built in '89-90 by Arch Beach Land & Water Co. No legal difficulties. SUPPLY.—Tunnel driven in hill, by gravity. Tunnel is 6 × 3 ft., 485 ft. long. DISTRIBUTION.—Mains, 3 miles. Taps, 50. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, 0. CONSUMPTION.—(Galls.) av., 4,000. PRESSURE.—Ordinary, 200 lbs. FINANCIAL.—Cost, $6,000. Cap. Stock: Authorized, $10,000; paid-up, $6,000. MANAGEMENT.—Rept. by owner, June 15, '96. SEWERS.—None.

7. **ARROYO GRANDE,** San Luis Obispo Co. (466.) Bought by R. Robison, June 17, '96; built by W. N. Short. Press rept., June, '96, stated Mr. Robison had bought two plants here. No franchise. City pays about $240 per yr. for public service. No legal difficulties. SUPPLY.—Creek, pumping to reservoirs and tanks. PUMPS.—Cap., 65,000 galls.; Hooker: steam, 25,000; power, 40,000. Wood used; av. cost, $3 per cord. RESERVOIRS.—Cap., 96,000 galls.: 60,000, 70 ft., and 36,000, 100 ft. above main street. TANKS.—Cap., 36,000 galls.; three, wood; 2—10,000 and 16,000. DISTRIBUTION.—Mains; cost extensions met by owner of works. Taps, 75; made by works at cost. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 4. CONSUMPTION.—(Galls.) av., 15,000; max., 30,000; min., 7,000. PRESSURE.—Ordinary, 25 lbs.; fire, 40 lbs. FINANCIAL.—Cost, $4,000. MANAGEMENT.—Rept. by owner, R. Robison, Nov. 21, '96. SEWERS.—None.

8, 9. **AUBURN,** Placer Co. (1,595.)

SOUTH YUBA WATER CO.

Built in '90; put in operation in May. No Engr. nor Contr. FRANCHISE.—Unlimited;

does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Mountain stream, by gravity from impounding reservoir. RESERVOIR.—Is 100 × 100 ft. × 12 ft. deep. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 3 miles; cost extensions met by general fund of Co. Taps, 200; made by Co. Services, iron; paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 30; private, 5. CONSUMPTION.—Unknown. FINANCIAL.—Cost, about, $30,000. Expenses: Operating, $3,800. Revenue, $5,165: City, fire protection, $600; street sprinkling, $100; public buildings, $465; other purposes, $4,000. MANAGEMENT.—Rept. by Clk., W. R. Arthur, June 17, '96. SEWERS.—Has sanitary sewers only.

AUBURN WATER-WORKS CO.

Built in '87 by F. W. Birdsall; known as Auburn Water-Works Co. SUPPLY.—Bear River canal, by gravity to reservoir, through 13-in. inverted siphon, with 120-ft. fall and rise. RESERVOIR.—Cap., 4,000,000 galls.; area, 1 acre; 370 ft. above town. DISTRIBUTION.—Mains, 15.5 miles. Hydrants, 33. CONSUMPTION.—(Galls.) av., 200,000. PRESSURE.—370 ft. head. FINANCIAL.—Cost, $40,000. No debt. Revenue, City, $1,200. NOTE.—No rept. since '90-1 Manual.

10. **AZUSA,** Los Angeles Co. (Est., 514.) Built in '87 by Azusa Land & Water Co. SUPPLY.—San Gabriel River, by gravity to reservoir. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—(In '88.) Mains, 6 miles. Taps, 85. FINANCIAL.—(In '88.) Cost, $35,000. Cap. Stock, $500,000. No debt. NOTE.—No rept. since '90-1 Manual.

11. **BAKERSFIELD,** Kern Co. (2,626.) Now owned by Scribner & Wible Co.; built in '83-4 by Bakersfield Water Co. FRANCHISE.—50 yrs. from '83. Co. receives no compensation for public service. SUPPLY.—Deep wells, pumping to tanks. PUMPS.—Cap., 1,800,000 galls.; 1,000,000 Worthington; 800,000 Blake. Wood used; av. cost, $4 per cord. TANKS.—Cap., 87,000 galls.; 54,000 and 33,000. DISTRIBUTION.—Mains, 13 miles. Hydrants, public, 16. CONSUMPTION.—(Galls.) av., 1,000,000; min., 400,000. PRESSURE.—Ordinary, 30 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—(In '90.) Cost, $30,000. Cap. Stock, $30,000; paid 15% div'd in '90. No debt. MANAGEMENT.—Rept. by Treas., W. H. Scribner, June 10, '96. SEWERS.—Has sanitary sewers.

12. **BENICIA,** Solano Co. (2,361.) Built in '80 by Benicia Water Co. No franchise required by state laws. Co. is not exempt from local taxes. City to pay $1,200 per yr. for public service. No legal difficulties. SUPPLY.—Sulphur Spring Creek and Paddy Ranch Creek, pumping to storage reservoir. PUMP.—Cap., 1,500,000 galls.; 1,250,000 from San Francisco Tool Co.; 250,000 Knowles. Wellington coal used; av. cost, $8.50 per short ton. RESERVOIRS.—Cap., 81,250,000 galls.: Impounding, 5,000,000, at pumping station; distributing, 1,250,000; storage, 75,000,000. FISCAL YEAR CLOSED Oct. 20. DISTRIBUTION.—Mains, 8 miles; cost extensions met by assessments. Taps, 450; made by Co. free. Services, w. i.; paid for by property owner. Meters: 130; owned, controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 30; private, 3. CONSUMPTION.—(Galls.) av., 250,000; max., 300,000; min., 200,000. Three large tanneries use greater part of water. PRESSURE.—Ordinary, 90 lbs. FINANCIAL.—Cost, $155,000. Cap. Stock: authorized, $300,000; paid-up, $155,000. Expenses, Operating, $9,000; taxes, $400. Revenue, $14,200: Consumers, unmetered, $4,000; metered, $9,000; City, fire protection, $1,200. MANAGEMENT.—Prest., F. W. Sumner, San Francisco; Secy., D. M. Hart. Rept. by Supt. and Pump. Engr., A. Robinson, June 8, '96. PROJECTED IMPROVEMENTS.—A water tower in storage reservoir. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 21, 83.

13. **BERKELEY,** Alameda Co. (5,101.) Built in '75; owned by Mrs. Moses Hopkins, under corporate name Alameda Water Co. FRANCHISE.—Perpetual. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Tunnels, springs and artesian wells, by gravity. RESERVOIRS.—Cap., 56,000,000 galls.: Storage, 35,000,000; distributing, 20,000,000 and 1,000,000. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 20 miles. Taps, 1,400; made by Co. for $7 to $10. Services, galv. i.; paid for by consumer. Meters: 120; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 55; private, 3. CONSUMPTION.—(Galls.) av., 800,000; max., 1,000,000; min., 500,000. PRESSURE.—Ordinary, 50 to 120 lbs. FINANCIAL.—Revenue, $4,125: Consumers, $40,000; City, fire protection, $325; street sprinkling, $800. MANAGEMENT.—Prest., Jas. H. Benedict; Secy. and Treas., C. A. Grow, both of San Francisco. Rept. by Supt., L. Wellendorff, July 8, '96. PROJECTED IMPROVEMENTS.—Boring more artesian wells. SEWERS.—Has sanitary sewers.

14. **BODIE,** Mono Co. (595.) Built in '83 by town and Prescott & Co. SUPPLY.—Shaft of mine, pumping to reservoir. PUMP.—Cap., 500,000 galls.; Cornish, owned by Prescott & Co. RESERVOIR.—Cap., 180,000 galls.; on hill 120 ft. high. DISTRIBUTION.—(In '88.) Mains, ¾ mile. Taps, 12. Hydrants, 9. NOTE.—No rept. since '90-1 Manual.

15. **CALISTOGA,** Napa Co. (Est., 1,132.) Built by W. F. Fisher. FRANCHISE.—50 yrs. SUPPLY.—By gravity. DISTRIBUTION.—Mains, 2. Services, paid for by consumer. Proprietor can compel use of meters and any consumer may have one.

Hydrants, public, 13. PRESSURE.—60 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Rept. by Prop., W. F. Fisher. SEWERS.—None.

16. **CAMPBELL,** Santa Clara Co. (Not given.) Built in '94 by Campbell Water Co. Engrs. and Contrs., Oakland Iron Wks. FRANCHISE.—50 yrs. from '94. Co. is not exempt from local taxes and receives no compensation for public service. No legal difficulties. SUPPLY.—Wells, pumping to tanks. PUMP.—Cap., 1,500,000 galls. Av. cost of coal used, $5 per short ton. TANKS.—Four; wood; on elevated trestle. FISCAL YEAR CLOSED June 1. DISTRIBUTION.—Mains, 2 miles; cost extensions met by Co. Taps, made by consumer. Services, iron; paid for by consumer. Meters, 0. Use of meters optional with consumer. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 40 lbs. FINANCIAL.—Cost, $8,000. Cap. Stock: Authorized, $7,500; paid-up, $3,500. Bonded debt, $4,000, at 8%; due '97. MANAGEMENT.—Prest., Benj. Campbell. Rept. by Secy. and Supt., F. M. Righter, June 12, '96. SEWERS.—None.

17. **CENTINELA** (P. O. Inglewood), Los Angeles Co. (Not given.) Built in '87-8 by Centinela-Inglewood Land Co. SUPPLY.—Inglewood Springs, developed by excavation and artesian wells, pumping to reservoir. PUMP.—Cap., 1,250,000 galls.; Worthington comp. non-cond. RESERVOIR.—Cap., 500,000 galls. DISTRIBUTION.—Mains, 18 miles. Taps, 105. Hydrants, 3. CONSUMPTON.—(Galls.) av., 6,000. PRESSURE.—Ordinary, 90 ft. head. Expenses, $750. Revenue, $1,700: Consumers, $900; other purposes, $800. NOTE.—No rept. since '90-1 Manual.

18. **CHICO,** Butte Co. (2,894.) Built in '75 by Chico Water Co. FRANCHISE.—50 yrs. from '75. Co. is not exempt from local taxes. City to pay "$140.50 per month + $7.50." No legal difficulties. SUPPLY.—Four wells, with tunnels running into gravel beds, pumping to tanks. PUMPS.—Cap., 2,000,000 galls.; 1,000,000 each Hooker; also Thompson & Evans. Oak wood used; av. cost, $4.50 per cord. TANKS.—Cap., 60,000 galls.; wood, on wood tower, 34 × 56 ft., × 50 ft. high. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8½ miles. Taps, 500; made by Co. at $8 for ¾-in., larger in proportion. Services, iron; paid for by consumer from curb. Meters, 1; used for test purposes only. Hydrants, public, 50; public cisterns, 13. CONSUMPTION.—(Galls.) av., 454,500; max., 1,144,858; min., 151,375. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Expenses, Operating, $7,500. Revenue, $13,404: Consumers, $12,500; City, fire protection, $100; street sprinkling, $600; public buildings, $144; park, $60. MANAGEMENT.—Prest., Frank C. Lusk; Secy., A. G. Simpson; Treas., John R. Robinson. Rept. by Supt., Gilbert H. Taylor. SEWERS.—None. REFERENCE.—Eng. News, Feb. 20, '86.

D 1. **CLAREMONT,** Los Angeles Co. (Not given.) Built in '95 by Union Water Co. Co. is not exempt from local taxes and receives no compensation for public service. No legal difficulties. Supply, tunnel of Sycamore Water Development Co., by gravity. Taps, 60; made by Co. at consumer's expense. Services, ¾-in. iron; paid for by consumer. Meters: 6; owned, controlled and repaired by Co. Co. can compel use of meters and any consumer may have one. Hydrants, 0. Consumption, (galls.) av., 125,000; max., 250,000; min., 40,000. Large amount of water used for irrigating purposes in June, July and Aug. Pressure, ordinary, 50 lbs. Cost, $25,000. Cap. Stock: Authorized, $30,000; paid-up, $25,000; paid no div'd in '95. Floating debt, note of $1,250 at 6%. Prest., Archie Thompson. Rept. by Secy., J. P. Storrs, Pomona, Aug. 10, '96. No sewers.

19. **CLOVERDALE,** Sonoma Co. (763.) Built in '85-6 by Riverside Water Co. FRANCHISE.—50 yrs. SUPPLY.—Russian River, pumping from well on bank to reservoir. PUMP.—Cap., 500,000 galls.; Worthington. Pine wood used; av. cost, $3.50 per cord. RESERVOIR.—Cap., 300,000 galls.; distributing, 175 ft. above river and 125 ft. above highest portion of city. FISCAL YEAR CLOSED Sept. 4, '95. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by general treasury. Taps, 200; made by Co. free. Services, iron; paid for by consumer. Meters: 30; owned, controlled and repaired by Co. Use of meters compulsory for wasteful consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 30; private, 5. CONSUMPTION.—(Galls.) av., 75,000; max., 125,000; min., 25,000. PRESSURE.—Ordinary and fire, 65 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock: Authorized, $20,000; all paid-up. Expenses, Operating, $1,962. Revenue, $2,323. MANAGEMENT.—Prest., W. D. Sink. Rept. by Secy. and Supt., J. H. Kleiser, June 7, '96. PROJECTED IMPROVEMENTS.—Gravity supply; line surveyed. SEWERS.—Has storm and partial sanitary sewers.

P 1. **CLOVIS,** Fresno Co. (Not given.) Rept. in Jan., '97, that Frank E. Browe would begin construction of works soon.

20. **COLTON,** San Bernardino Co. (1,315.) Bought by city early in '95 for about $40,000; built by Colton Terrace Land & Water Co., date not given; sold Jan. 1, '89 to Colton City Water Co. FRANCHISE.—20 yrs. SUPPLY.—"Cienga" and eight artesian wells. DISTRIBUTION.—Mains, 10.3 miles. Taps, 265. Hydrants, 20. FINANCIAL.—Cost, $50,000. Cap. Stock, $250,000. Bonded debt, $25,000. NOTE.—No rept. since '90-1 Manual.

D 2. **COLUMBIA,** Tuolumne Co. (Est., 812.) Built in '53 by New England Water Co. under 50 yrs. franchise. Supply, springs and Stanislaus River, by gravity. Reservoirs, cap., 90,000 galls.; two. (In '88.) Mains, 5 miles. Taps, 75. Hydrants, 0. Consumption, (galls.) av., 30,000. Pressure, ordinary, 30 lbs. Cost, $24,000. No debt. Expenses, $800. Revenue, $1,100. Figures from '89-90 Manual.

21. **COLUSA**, Colusa Co. (1,336.) Built in '69 by J. B. Cooke. Co. is not exempt from local taxes. City to pay $30 per hydrant per yr. No legal difficulties. SUPPLY.—Sacramento River, pumping to tanks. PUMP.—Cap., 1,000,000 galls.; Worthington comp. dup.; 1,000,000 Knowles. Oak wood used; av. cost, $4.50 per cord. TANKS.—Cap., 54,000 galls.; two, on towers 50 ft. high; one 10 × 84 ft., cap., 20,000; one 10 × 25 ft., cap., 14,000; also one for fire service on tower 92 ft. high, 12 × 25, cap., 20,000. DISTRIBUTION.—Mains, 5½ miles; cost extensions met by cash. Taps, 320; made by works for $2.50. Services, iron; paid for by consumer. Meters: 2; owned, controlled and repaired by works. Use of meters optional with works. Hydrants, public, 27; private, 1. CONSUMPTION.—(Galls.) max., 400,000; min., 200,000. PRESSURE.—Ordinary, 22 lbs.; fire, 40 lbs. FINANCIAL.—No debt. No deficits. Pays 7% interest after deducting expenses and repairs. MANAGEMENT.—Ch. Pump. Engr., W. B. Cooke. Rept. by Supt., J. B. Cooke, June 6, '96. SEWERS.—None. REFERENCE.—Eng. News, Mar. 10, '83.

22. **CORONADO**, San Diego Co. (Not given.) Built prior to June, '92, by Coronado Water Co. FRANCHISE.—Reserved before city's incorporation; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay $4,000 per yr. for rental of hydrants and water for fire protection. No legal difficulties. SUPPLY.—Two wells in bed of Otay River; river is dry in summer, but water is pumped from underflow to tank. PUMPS.—Cap., 1,000,000 galls.; 400,000 Dow comp. and 600,000 Worthington comp. dup. Wallsend (Australian) coal used; av. cost, $7.25 per short ton. TANK.—Cap., 500,000 galls.; iron; on elevated ground. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 25 miles; cost extensions met by current receipts. Taps, 600; made by Co. at $16.50 for 6-in. main and larger; $8.25 for smaller than 6-in.; ¾-in. taps. Services, black dipped pipe; paid for by Co. Meters: 200; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters to detect waste and any consumer may have one by paying for setting the same. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 354,000; max., 601,410; min., 179,910. Total for Jan., 7,126,190; for June, 14,754,206, difference due to irrigation. PRESSURE.—Ordinary, 40-90 lbs. FINANCIAL.—Cost, $359,000. Cap. Stock: authorized, $480,000; paid-up, $477,000; paid no div'd in '95. Floating debt, $37,500, at 6%. Expenses, $13,313: Operating, $10,080; int., $2,523; taxes, $710. Revenue, $16,946: Consumers, $10,886; City, fire protection, $5,000; street sprinkling, $1,060; including tree watering. MANAGEMENT.—Prest., E. T. Babcock; Secy. and Treas., E. Breitenstein. Rept. by Ch. Pump. Engr., Geo. Eby, Otay, July 24, '96. SEWERS.—Has sanitary sewers.

23. **CUCAMONGA**, San Bernardino Co. (Precinct, 416.) Owned since '87 by Cucamonga Water Co.; built in '86-7 by Cucamonga Land Co. SUPPLY.—Artesian wells and tunnels, by gravity to reservoirs. RESERVOIRS.—Cap., 5,000,000 galls.; five, 1,000,000, within a radius of two miles. FISCAL YEAR CLOSED in Oct. DISTRIBUTION.—Mains, 58 miles; cost extensions met by assessments and water rates. Taps, 150; made by Co. at cost. Services, 1-in.; paid for by consumer. Use of meters compulsory for irrigation. CONSUMPTION.—During irrigation season (Galls.), av., 9,000,000; max., 10,000,000; min., 7,000,000; during winter only 1-10 of this amount. PRESSURE.—Ordinary, 50 lbs. FINANCIAL.—No debt. Expenses, operating, $3,296. Revenue, $2,377: Consumers, domestic, $579; irrigation, $1,798. MANAGEMENT.—Prest., A. S. Gaylord; Treas., E. T. Wright; Supt., O. T. Sutton. Rept. by Secy., Geo. E. Scott, June 6, '96. SEWERS.—None.

24. **DIXON**, Solano Co. (1,082.) Built in '90 by Dixon Light & Water Co.; put in operation June 1. Engr. and Contr., J. G. McCredy, San Francisco. FRANCHISE.—50 yrs. from '90. Co. is not exempt from local taxes. City to pay for public service. SUPPLY.—Wells, 390 ft. deep, pumping to tank. PUMP.—Cap., 60,000 galls.; Thompson & Evans. Av. cost of coal used, $2.87½ per short ton. TANKS.—Cap., 100,000 galls.; two, 50,000. FISCAL YEAR CLOSED in June. DISTRIBUTION.—Mains: cost extensions met by Co. Taps, 106; made by Co. for $10. Services, black iron; paid for by consumer. Meters, 0. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 50,000; max., 90,000; min., 20,000. PRESSURE.—Ordinary and fire, 26 lbs. FINANCIAL.—Cost, $38,000. Cap. Stock: Authorized, $60,000; paid-up, $40,000; paid no div'd in '95. Expenses, $3,760: Operating, $3,600; taxes, $160. Revenue, $3,620: Consumers, unmetered, $2,900; City, fire protection, $720. MANAGEMENT.—Prest., J. G. McCredy, San Francisco. Rept. by Secy., F. H. Hutton, June 5, '96.

25. **DUTCH FLAT**, Placer Co. (682.) Owned by Isaac T. Coffin; built in '59 by individual. FRANCHISE.—Perpetual. Co. is not exempt from local taxes and receives no compensation for public service. No legal difficulties. SUPPLY.—Springs and mining ditch, by gravity. RESERVOIRS.—Cap., 235,000 galls.: 200,000, 175 ft. above town; 25,000; two, 5,000. DISTRIBUTION.—Mains, 1 mile; cost extensions met by owner of works. Taps, 100; made by owner of works, free. Services, iron and lead; paid for by owner of works. Meters, 0. Use of meters optional with consumer. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 100,000; max., 200,000; min., 50,000. PRESSURE.—Ordinary, 15 to 20 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $6,000; paid 10% div'd in '95. No debt. Expenses, $321: Operating, $300; taxes, $21. Revenue, Consumers, $925. $2,500 given on first cost for perpetual fire protection guaranteed. MANAGEMENT.—Rept. by owner, June 10, '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, July 29, '82.

P 2. **EAST SANTA CRUZ**, (P. O. Santa Cruz), Santa Cruz Co. (Not given.) Henry Cowell proposes to build works in '97, and has secured permission from county supervisors. Supply, Eagle Creek, by gravity to and from reservoir. Rept. by E. V. Cowell, Dec. 2, '96.

26. **ELK GROVE**, Sacramento Co. (202.) Bought in June, '96, by C. H. Dixon; put in operation Mar. 1, '95. Engr., W. E. Everson. FRANCHISE.—50 yrs. from '94. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Well, pumping direct and to tank. Well is 12 × 190 ft., cased; water from 9-ft. gravel stratum, 153 ft. below surface. PUMP.—Cap., 300,000 galls.; Worthington dup. Oak wood used; av. cost, $4.50 per cord. TANK.—Cap., 50,000 galls.; redwood, 33 × 16 ft., on tower 64 ft. high. DISTRIBUTION.—Mains, ⅛ mile. Taps, 35; made by consumer. Services, ¾-in. and 1-in. iron; paid for by consumer. Meters, 0. Hydrants, public, 12. CONSUMPTION.—(Galls.) av., 40,000; max., 60,000; min., 15,000. PRESSURE.—Ordinary, 25 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $8,500. Expenses, operating, $525. Revenue, $1,080: Consumers, $540; street sprinkling, $90; irrigation, $350; public buildings, $50. MANAGEMENT.—Supt., C. H. Dixon; Ch. Pump. Engr., L. Bower. Rept. by W. E. Everson, Sept. 17, '96. SEWERS.—None.

P 3. **ELSINORE**, Riverside Co. (Not given.) Dec., '96, ordinance had been introduced in city council calling for election to vote bonds for water-works and irrigation system. Cy. Clk., L. B. Peck. Press rept., Feb., '97, stated $20,000 of bonds had been voted.

27. **ESCONDIDO**, San Diego Co. (541.) Transferred to Escondido Irrigation District in '95; built in '87-8 by Escondido Land & Water Co. SUPPLY.—San Luis Rey River, carried in flume and canal for 20 miles to storage reservoir, thence in canal flumes and pipes for 8 miles to distributing reservoir. RESERVOIRS.—Cap., 1,501,000,000 galls.; storage, 1,500,000,000; distributing, 1,000,000, covered. DISTRIBUTION.—Mains, 6 miles, in city. Taps, 150. Meters, 30. Hydrants, public, 6. CONSUMPTION.—(Galls.) av., 100,000. FINANCIAL.—Cost of city portion of system, $40,000. MANAGEMENT.—Rept. by Gen. Supt., W. A. Sickler, Sept. 21, '96.

—? **ETNA** (P. O. Grass Valley), Nevada Co. (Not given.) Press rept., Jan. 29, '97, stated Etna Development Co. was constructing works.

28. **EUREKA**, Humboldt Co. (4,858.) Owned by Ricks Water Co. Built in '79 by C. S. Ricks. FRANCHISE.—25 yrs. from '77; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay $2,475 per yr. for hydrant rental. LEGAL DIFFICULTIES.—City attempted to put in its own plant without offering to buy Co. plant. SUPPLY.—Elk River, pumping to tank. PUMPS.—Cap., 2,000,000 galls.: Knowles, 1,500,000; others 500,000. Redwood mill edgings used; av. cost, 95 cts. per cord. FILTERS.—Cap., 1,000,000 galls.; Hegeman & Oliphant. TANK.—Cap., 477,000 galls.; redwood; 52 × 30 ft. FISCAL YEAR CLOSED Mar. 5. DISTRIBUTION.—Mains, 27 miles; cost extensions met by Co. Taps, 480; made by Co. at $1.50 for ½-in., $3 for ¾-in., $8 for 1-in. and $16 for 2-in., including service to property line. Services, w. i.; paid for by consumer on his own property. Meters: 185; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for hotels, livery stables, shipping and large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 55; private, 2. CONSUMPTION.—(Galls.) av., 250,000; max., 325,000; min., 190,000. PRESSURE.—Ordinary, 79 lbs. Two steam fire engines are used. FINANCIAL.—Cost, $171,500. Cap. Stock: Authorized, $150,000; all paid up. Expenses, $8,929: Operating, $7,986; taxes, $943. Revenue, $12,787; City, fire protection, $2,475. MANAGEMENT.—Prest., Richard Sweasey. Rept. by Secy. and Supt., H. L. Ricks, June 11, '96. SEWERS.—Has small sanitary system. REFERENCE.—Filter gallery washing, Eng. News, Apr. 11, '91.

29. **FELTON**, Santa Cruz Co. (259.) Built in '89 by Felton Water Co. SUPPLY.—Bull Creek, by gravity. DISTRIBUTION.—Mains, 1.3 miles. PRESSURE.—Ordinary, 260 ft. head. FINANCIAL.—Cost, $3,000. Cap. Stock, $10,000. NOTE.—No rept. since '90-1 Manual.

D 3. **FERNDALE**, Humboldt Co. (763.) Leased and operated by Geo. M. Brice; owned by Mrs. Grace Francis; built in '73. Supply, spring, by gravity. Mains, 7 miles. Taps, 140. Hydrants, 0. Consumption, (galls.) av., 50,000. Pressure (in '88), 25 lbs. Cost, $18,500. No debt. Expenses, $500. Revenue, $2,000. No rept. since '89 Manual.

1. **FITCHBURG** (P. O. Alameda), Alameda Co. See Alameda.

30. **FOLSOM CITY**, Sacramento Co. (699.) Built in '88 by Natoma Vineyard Co. SUPPLY.—American River, through canal, by gravity. DISTRIBUTION.—Mains, 1 mile. Taps, 50. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 30 lbs. FINANCIAL.—Cost, $2,000. MANAGEMENT.—Rept. by Supt., C. H. Schussler, Oct. 9, '96.

31. **FORT BRAGG**, Mendocino Co. (945.) Built in '89 by Fort Bragg Water Co. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 700,000 galls. DISTRIBUTION.—Mains, 2 miles. Consumers, 55. Hydrants, 12. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—25 lbs. FINANCIAL.—Cost, $8,000. Debt, $2,000 at 10%. NOTE.—No rept. since '90-1 Manual.

32, 33. **FORTUNA**, Humboldt Co. (Est., 700.)

HENRY ROHNER'S PLANT.

Built in '87. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 29,000 galls. DISTRIBUTION.—Mains, 1¼ miles. Taps, 33. Services, galv. i. Hydrants, 6. FINANCIAL.—Cost, $3,500. No debt. Expenses, $200. Revenue, $600. MANAGEMENT.—Henry Rohner.

W. M. MORGAN'S PLANT.

Built in '90. Supply, springs, by gravity to tank. Tank, cap., 6,000 galls. Mains, ½ mile. Expenses, $60. Revenue, $360.

NOTE.—No rept. for above two plants since '90-1 Manual.

34. **FRESNO**, Fresno Co. (10,818.) Built in '76 by Fresno Water Co. FRANCHISE.—50 yrs. SUPPLY.—Eleven 8-in. wells, 150 to 600 ft. deep, pumping to tank. PUMPS.—A 4,000,000-gall. rotary, run by electricity from San Joaquin Elec. Co. power plant. TANK.—Cap., 250,000 galls. DISTRIBUTION.—Mains, 35 miles. Hydrants, public, 83. FINANCIAL.—Cap. Stock, $500,000. MANAGEMENT.—Rept. by Secy., J. M. Collier, Dec. 30, '96. REFERENCE.—Eng. News, Feb. 7, '85.

35. **GILROY**, Santa Clara Co. (1,694.) Bought by city about '87 for $18,000, works having cost $94,000; built in '71-2 by Co. SUPPLY.—Moas River, 11½ miles distant, by gravity to reservoir, with pumping from wells in extreme dry weather. CONDUIT.—(In '89.) Hard wood 18 ins. sq. for 6 miles, then 17 to 13-in. w. i. pipe for 3 miles. Press rept. in '92 states city had just replaced old conduit by 30,459 ft. of w. i. pipe from dam to reservoir, and 13,345 ft. from reservoir to city. PUMPS.—Two 400,000-gall. Hooker rept. in '89; makers rept. 500,000 Worthington simple high pressure. RESERVOIR.—2½ miles and 90 ft. above town. DISTRIBUTION.—Mains (Mar., '92), about 6 miles. Taps, 250. Meters, 0. Hydrants (Mar., '93), 28. FINANCIAL.—Purchase price, $18,000; improvements, '91-2, $45,000. Revenue: Consumers (in '88), $4,500. NOTE.—No official rept. since '90-1 Manual. REFERENCE.—Eng. News, Jan. 27, '83.

P 4. **GLENDORA**, Los Angeles Co. (Est., 164.) Citizens Water Co. began to build works Nov. 4, 96, and expected to complete plant in June, '97. Only domestic supply proposed at start. No Contr. Supply, wells and tunnels, by pumping. Est. cost, $50,000. Cap. stock, authorized, $50,000. Rept. by Gen. Mgr., Wm. H. Craig, Nov. 18, '96.

36. **GRASS VALLEY**, Nevada Co. (Est., 4,500.) Built in '66-7 by town. SUPPLY.—South Yuba River, by gravity through open ditch to reservoirs. RESERVOIRS.—Three; 210 ft. above town; 300 × 500 ft., 100 × 150 ft.; and 300 ft. sq. DISTRIBUTION.—(In '88.) Mains, 10 miles. Taps, 700. Hydrants, 68. CONSUMPTION.—(Galls.) av., 170,000. PRESSURE.—(In '88.) 100 lbs. FINANCIAL.—Cost (in '87), $80,000. Expenses, $6,000. Revenue, $9,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 28, '85.

D 4, F 1. **HANFORD**, Kings Co. (Est., 942.) Built in '81 by Robinson & Rawlins, under 50 yrs. franchise. Co. is not exempt from local taxes. No legal difficulties. Supply, artesian wells, pumping to elevated tanks. Pump, cap., 750,000 galls.; Hall comp. dup. Oak wood used; av. cost, $4 per cord. Tanks, cap., 80,000 galls.; 50,000 redwood on trestle; 30,000 iron, on tower. Mains, 7 miles; cost extensions met by earnings. Taps, 300; made by Co. for $2.50. Services, iron; paid for by property owner. Use of meters optional with consumer. Consumption, (galls.) av., 13,000; max., 16,000; min., 10,000. Pressure, ordinary, 32 lbs. Cost, $40,000. Supt. and Ch. Pump. Engr., E. Kauntze. Rept. by owners, Dec. 5, '96. Has sanitary sewers only.

CITY PLANT.

Robinson & Rawlins rept. that city has direct pressure system for fire protection. Press rept. in '93 stated such a system was under construction.

37. **HAYWARDS**, Alameda Co. (1,419.) Now owned by San Lorenzo Water Co., 722 Montgomery St., San Francisco, who bought it in or since '92; built in '88 by Knox Bros. FRANCHISE.—50 yrs. SUPPLY.—Wells, pumping to reservoir and direct. A well, 25 × 58 ft., with tunnel 100 ft. long extending from bottom, was constructed in '89. PUMPS.—Cap., 1,600,000 galls.; 600,000 and two 500,000 Dow. RESERVOIR.—Cap., 650,000 galls.; 100 ft. above town. DISTRIBUTION.—Mains, 6 miles. Taps, 201. Meters, 4. FINANCIAL.—Cost (in '88), $42,500. Expenses, $1,634. Revenue, $3,985: Consumers, $3,000; City, fire protection, $864; other purposes, $121. MANAGEMENT.—Supt., Mr. Darling. Rept. by Mrs. Wm. Knox, Sept. 19, '96. NOTE.—No rept., except as to ownership and management, since '90-1 Manual.

38, P 5. **HEALDSBURGH**, Sonoma Co. (1,485.) Owned by Frank Koenig; built in '76; bought May 1, '84, by F. & A. Koenig. FRANCHISE.—50 yrs. Co. is not exempt from local taxes. City to pay $240 for plaza, $426 for fire protection and $30 for city hall, per yr. No legal difficulties. SUPPLY.—Russian River, pumping to reservoir. PUMP.—Cap., 500,000 galls.; Blake. Wood used. RESERVOIR.—Cap., 300,000 galls. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains, 4 miles; cost extensions met by "private expenditure." Taps, made by consumer for $10. Services, paid for by consumer. Proprietor cannot compel, but may prohibit use of meters. FINAN-

CIAL.—Cost, $10,000. MANAGEMENT.—Rept. by C. H. Doud, Oct. 21, '96. SEWERS.—Has storm sewers only.

PROPOSED MUNICIPAL WORKS.

Dec., '96, city engaged Paul Perkins to make surveys, plans and estimates for city works. Press rept., Mar., '97, stated Mr. Perkins had submitted rept.; est. cost, including pumps, $44,000. Also rept. that city talked of buying above private plant.

39. **HOLLISTER**, San Benito Co. (1,284.) Built in '76 by Hollister Water Co. FRANCHISE.—50 yrs. from '78. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Artesian wells, pumping to reservoirs; also by gravity from mountains. PUMPS.—Cap., 2,000,000 galls.; Knowles. Wood used as fuel. RESERVOIRS.—Cap., 650,000 galls.; two storage and distributing; 400,000 and 250,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10 miles. Taps, 400; made by Co. Services, galv. i.; paid for by Co. Meters, 0. Hydrants, public, 25. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary and fire, 44 lbs. FINANCIAL.—Cost, $90,000. MANAGEMENT.—Prest., T. S. Hawkins; Ch. Pump. Engr., N. D. Hall. Rept. by Secy. and Supt., T. W. Hawkins, July 8, '96. SEWERS.—None. REFERENCE.—Eng. News, July 28, '88.

40. **INDEPENDENCE**, Inyo Co. (Est., 407.) Built in '87 by Independence Water Co. FRANCHISE.—50 yrs. SUPPLY.—Pinyon and Pine Creeks, by gravity. DISTRIBUTION.—Mains, 2 miles. Taps, 25. Hydrants, 5. CONSUMPTION.—(Galls.) av., 20,000. FINANCIAL.—Cost, $7,650. No debt. Expenses, $200. Revenue, $870. NOTE.—No rept. since '90-1 Manual.

17. **INGLEWOOD**, Los Angeles Co. (Not given.) See Centinela.

41. **JACKSON**, Amador Co. (Est., 1,500.) Owned by B. F. Richtmyer; built in '65. FRANCHISE.—20 yrs. from '98; does not provide for purchase of works by city. Co. is not exempt from local taxes and receives no compensation for public service. No legal difficulties. SUPPLY.—Springs and Blue Lakes Water Co.'s canal, by gravity, water passing to small reservoir from former and to tank alongside of ditch from latter. DISTRIBUTION.—Mains, 2,000 ft. Taps, 310; made by proprietor. Services, iron; paid for by property owner. Meters, 0. Hydrants, public, 32; private, 17. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—No debt. Expenses, $1,800: Operating, $1,200; other expenses, $600. MANAGEMENT.—Rept. by B. F. Richtmyer, June 9, '96. SEWERS.—None.

P 6. **LA CRESCENTA**, Los Angeles Co. (Not given.) Jan., '96, La Crescenta Water Co. began construction of tunnel to develop gravity supply. Co. intends to supply water for domestic use, only; had not secured capital for pipe lines at time of rept. Est. cost, $5,000 to $6,000. Engr., L. Friel, Los Angeles; Secy., W. C. White. Rept. by Prest., S. G. Wilson, June 17, '96.

76. **LAGONIA** (P. O. Redlands), San Bernardino Co. Supply from Redlands.

P 7. **LAKEPORT**, Lake Co. (991.) Oct. 23, '96, H. V. Keeling, Town Clk., rept. city proposed to build works. Press rept., Dec. 23, '96, stated A. L. Adams, 401 California St., San Francisco, had rept. on works, recommending pumping from wells through 6-in. main to 200,000-gall. reservoir. Est. cost, $17,250.

—? **LAKE VIEW**, Riverside Co. (Not given.) L. P. Hansen owns an irrigation plant, from which water is supplied to town. SUPPLY.—Artesian wells, pumping to reservoir. MANAGEMENT.—Rept. by Supt., R. C. McGill, in '96.

42. **LINCOLN**, Placer Co. (961.) Under construction in '96 by town; nearly completed in Dec. Engr., W. S. Graham, Auburn. Contrs., Scharr, Ingram, Batcher & Co., Sacramento. SUPPLY.—Capay ditch of the South Yuba Water Co.'s system, by gravity. RESERVOIRS.—Cap., 3,000,000 galls.; two impounding: Upper, 1,000,000; lower, 2,000,000, 206 ft. above town. Water passes from upper to lower reservoir through open ditch and a pipe line. DISTRIBUTION.—Mains, 4 miles. Taps, made by town, free. Services, w. i.; paid for by property owner. Meters, 0. Hydrants, public, 36. PRESSURE.—Ordinary and fire, 90 lbs. FINANCIAL.—Cost, $20,000. Bonded debt, $20,000, at 7%; due in 40 yrs. Sinking Fund, none. Deficits will be met by taxation. MANAGEMENT.—Rept. by Prest. Bd. Town Trustees, A. J. Gladding, Dec. 1, '96. SEWERS.—No sanitary sewers.

43, 44. **LIVERMORE**, Alameda Co. (1,391.)

LIVERMORE SPRING WATER CO.

Built in '75-6. SUPPLY.—Livermore Springs, pumping to reservoirs, and Arroyo Mocho, by gravity. PUMPS.—Cap., 480,000 galls.; from Aylward's Agricultural Works, Livermore. RESERVOIRS.—Cap., 1,000,000 galls.; three, in excavation. DISTRIBUTION.—Mains, 12 miles. Taps, 400. Hydrants, 15. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—(In '89.) Ordinary, 25 lbs. FINANCIAL.—Cost, $35,000. Debt, $3,700, at 8%. Expenses: Operating, $350. NOTE.—No rept. since '90-1 Manual.

LIVERMORE WATER & POWER CO.

Incorp. June 12, '96, and built works during summer. SUPPLY.—Springs and impounding reservoir. FINANCIAL.—Cap. Stock, $200,000. MANAGEMENT.—Incorporators: W. F. Boardman, Oakland; Jas. Stanley, Mission San Jose; Edw. McGary, Jr., San Francisco, and others.

D 5. **LODI**, San Joaquin Co. (1,013.) Built in '89-90 by Bay City Gas, Water & Electric Light Co.; put in operation June 1. Franchise, 25 yrs. Supply, wells, lifted by 500,000-gall. triple-acting pump to 70,000-gall. tank. Mains, 5 miles. Taps, 100. Pressure, 20 lbs. Cost, $100,000. Cap. Stock, $100,000. Bonded debt, $22,000. Revenue: Consumers, $1,800; City, none. No rept. since '90-1 Manual.

45. **LOMPOC**, Santa Barbara Co. (1,015.) Built i n'90 by town. Engr. and Contr., James H. McGee. SUPPLY.—Mountain springs, by gravity to and from distributing reservoir. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by general fund. Taps, 200; made by town for $1. Services, iron; paid for by consumers. Meters, 0. Use of meters optional with town. Hydrants, public, 12. FINANCIAL.—Cost, $12,000. Bonded debt, $8,400, at 7%. MANAGEMENT.—Prest. of Bd. of Trustees, W. J. McGee. Rept. by M. Pomeroy, Town Clk., July 28, '96. SEWERS. —None.

D 6. **LONG BEACH**, Los Angeles Co. (564.) Built about '94 by Alamitos Beach Water Co., for domestic and irrigation purposes, only. Supply, artesian wells, pumping to reservoirs at different elevations. Two (?) Worthington pumps; makers rept. instead 1,000,000 comp. non-cond. Crude petroleum used; also eucalyptus wood. Reservoirs, 50 ft. diam., 7 ft. deep; 100 ft. diam., 5 ft. deep; 130 ft. sq., 6 ft. deep; 130 × 90 ft., 5 ft. deep; all of brick laid on cement. Mains, 21 miles. Taps made by Co. Services, iron; paid for by property owner. Meters: Owned, controlled and repaired by Co. Use of meters optional with consumer with permission of Co.; compulsory for irrigating farmers. Hydrants, 0. CONSUMPTION.—(Galls.) av., 400,000; max., 600,000; min., 70,000 (in winter). Pressure, 20 to 55 lbs. Cost, $85,000. Cap. Stock: Authorized, $187,500; all paid-up. Expenses, Operating, $1,475. Revenue, $2,700. Prest., H. W. Hellman, Los Angeles; Treas., F. M. Bank, Los Angeles; Supt., C. H. Thornburg; Ch. Pump. Engr., J. T. Cullen. Rept. by Secy., Will F. Sweeney, Aug. 6, '96. No sewers.

46. **LOS ANGELES**, Los Angeles Co. (50,395.) Built in '62 by Los Angeles City Water Co. Since '90 this Co. has absorbed the Citizens' Water Co.'s plant, built in '73-4 under 50 yrs. franchise; the East Side Spring Water Co.; and the Crystal Springs Water Co. FRANCHISE.—30 yrs. from '68; contract provides for purchase of works by city. Regulation of rates by city is provided for by state law but limited by Co.'s special contract with city. Co. is not exempt from local taxes and receives no compensation for water used by city except that for parks. LEGAL DIFFICULTIES.—City, in order to save expense of making taps for street sprinkling hydrants, used fire hydrants to fill their carts; Co. enjoined them; case now pending. SUPPLY.—Crystal springs, located about 7 miles N. W. of city, supplies 4-5 of city, by gravity; balance by gravity from Arroyo Seco in addition to spring water pumped to higher elevations. PUMPS.—Cap., 6,000,000 galls.; 3,000,000 Worthington comp. dup. and 3,000,000 water power. Oil used; av. cost, $1 per bbl. of 42 galls. RESERVOIRS.—Cap., 64,600,000 galls. Low service: Bellevue, 40,000,000; Buena Vista, 15,000,000. High service: Beaudry, 6,000,000; Hazard, 600,000; Elysian, 3,000,000. DISTRIBUTION.—Mains, 329 miles. Taps, 16,860; made by Co., including service to curb, at $12 for ½-in.; $16 for ¾; $20 for 1-in., etc. Services, lead for 2 ft., balance galv. i.; paid for by consumer from curb. Meters: 200; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co.; compulsory for manufacturers and those whose consumption is variable. Hydrants, public, 495; private, 20. CONSUMPTION.—(Galls.) av., 11,000,000; max., 13,000,000; min., 8,500,000. PRESSURE.—Ordinary and fire, 50 lbs. Steam fire engines are used. FINANCIAL.—Withheld. MANAGEMENT.—Prest., Wm. H. Perry; Secy., S. H. Mott; Ch. Pump. Engr., Fred. Fisher. Rept. by Supt., Wm. Mulholland, June 8, '96. SEWERS. —Has sanitary and storm sewers. REFERENCES.—Eng. News, Dec. 9, '82; new reservoir, Jan. 17, '95, illus.

—?, 47. **LOS GATOS**, Santa Clara Co. (1,652.)

COLD SPRING WATER CO.

Construction begun in '90 or '91; see note. FRANCHISE.—25 yrs. SUPPLY.—Impounding reservoir on Mountain Stream, by gravity. RESERVOIR.—Cap., 2,500,000 galls. DISTRIBUTION.—Mains, 4.5 miles. Hydrants, 20. FINANCIAL.—Cost, $32,000. Cap. Stock: Authorized, $60,000. Bonded debt, $30,000. NOTE.—No rept. since '90-1 Manual. Press repts. state that this Co. had trouble with its works, and that after one or more grants city refused in Mar., '92, to again extend time for completion. In '96, letter to Co. was returned unclaimed, endorsed: "No such Co. any more."

MOUNTAIN SPRING WATER CO.

Built in '91, absorbing distribution system previously built by Jno. Dean. SUPPLY.—Stream, at point some 850 ft. above town, by gravity to and from reservoir. RESERVOIR.—Cap., 3,000,000 galls. (press rept.). Rept. by Secy., N. E. Beckwith, Nov., '91.

D 7. **MADERA**, Madera Co. (950.) Built in '85 or '86 by Madera Flume & Trading Co. Supply, well, pumping to 16 × 12-ft. tank. Pumps, cap., 750,000 galls.; Worthington simple high pressure (rept. by makers in '96). Mains, 1½ miles. Taps, 100. Cost, $5,000. No debt. Expenses, $1,000. Revenue, $3,000. No rept. since '90-1 Manual.

48. **MARTINEZ**, Contra Costa Co. (1,600.) Built in '88 by Geo. W. McNear. FRANCHISE.—20 yrs. SUPPLY.—Wells, gathered in reservoir, pumping to tank. PUMP.—

Cap., 250,000 galls.; Dow. DISTRIBUTION.—Mains, 5 miles. Taps, 155. Meters, 12. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 150,000. FINANCIAL.—Cost, $35,000. Cap. Stock: Authorized, $40,000; all paid-up. No debt. MANAGEMENT.—Prest. and Secy., Geo. W. McNear, Jr., 326 California St., San Francisco. Agt., R. B. Borland.

49. **MARYSVILLE,** Yuba Co. (3,991.) Built in '58 by Marysville Water Co. FRANCHISE.—50 yrs. SUPPLY.—Two artesian wells, pumping to tank. PUMPS.—Cap., 1,250,000 galls.: 750,000 Worthington; 500,000 Gaskill. TANK.—Cap., 250,000 galls. DISTRIBUTION.—Services, w. i. Hydrants, public, 15. In '80 there were 8 miles of mains, 700 taps and 12 hydrants. PRESSURE.—Ordinary, 22 lbs. FINANCIAL.—Cost, $200,000. Cap. Stock, $200,000. Bonded debt, $20,000. MANAGEMENT.—Prest., Edw. Woodruff. Rept. by Secy., E. E. Meek, Sept. 19, '96.

D 8. **MENLO PARK,** San Mateo Co. (Est., 885.) Built in '64 by Menlo Park Water Co. Supply, surface water, by gravity. In '90-1 improvements were in course of construction. Reservoir (?), cap., 125,000,000 galls.; area, 15 acres. Mains, 11 miles. Taps, 125. Meters, 48. Cost, $250,000 (?). No rept. since '90-1 Manual.

50. **MERCED,** Merced Co. (2,009.) Bought in '89 by Crocker-Huffman Land & Water Co., from W. L. Sillman and J. J. Stevenson, who built works in '80-1. FRANCHISE.—25 yrs. Co. is not exempt from local taxes. City to pay for public service. SUPPLY.—Merced River, by gravity through canal 21 miles long to reservoir, thence by 5½ miles of mains to city. RESERVOIR.—Cap., 3,000,000,000 galls.; storage; area, 500 acres. DISTRIBUTION.—Taps, 260; made by Co. for $1. Services, lead; paid for by consumer. Meters, 0. Hydrants, public, 44. PRESSURE.—Ordinary, 38 lbs. One steam fire engine is used. FINANCIAL.—Cost, $400,000. Expenses: Operating, $1,000, not including salary of Supt. Revenue, $9,260: Consumers, unmetered, $6,500; City, fire protection, $1,320; street sprinkling, $840; public buildings, $600. MANAGEMENT.—Prest., W. H. Crocker; Secy., C. E. Green, both of San Francisco; Supt., C. D. Martin. SEWERS.—None.

51. **MISSION SAN JOSE,** Alameda Co. (Est., 759.) Built in '70 by Co. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—(In '87.) Mains, ½ mile. Taps, 30. Hydrants, 12. CONSUMPTION.—(Galls.) av., 20,000. FINANCIAL.—Expenses, $40. Revenue, $600. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 1, '82.

52. **MODESTO,** Stanislaus Co. (2,402.) Bought by city in '94 or '95; built in '76 by Modesto Water Co. FRANCHISE.—50 yrs. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Cap., 1,000,000 galls.; two Blake. TANK.—Cap., 100,000 galls.; 112 ft. above pumps. DISTRIBUTION.—(In '88.) Mains, 8 miles. Taps, 450. Hydrants, 15. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—(In '89.) Ordinary, 30 lbs. FINANCIAL.—(In '88.) Cost, $40,000. Cap. Stock, $20,000. No debt. Expenses, $7,125. Revenue, $10,604. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, June 21, '84.

53. **MONROVIA,** Los Angeles Co. (907.) First supplied in '85; present works built in '91 by city. Manual for '90-1 described plant built by Santa Anita Water Co. in '85. Rept. for this Manual states: "First work done in Aug., '95;" no change in ownership. SUPPLY.—Tunnels in Sierra Madre Mts., by gravity. RESERVOIRS.—Cap., 3,700,000 galls.; 700,000 and 3,000,000. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 15 miles. Taps, 4,300 (?); made by property owner, no fee. Services, 2-in. iron; paid for by city. Meters, 0. Hydrants, public, 24; private, 7. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 70 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $52,000, at 6%; $2,000 paid annually. Expenses: Operating, about $1,500. All expenses are met by taxation; ownership of land includes all water needed. MANAGEMENT.—Prest., C. O. Monroe; Secy., W. A. Walker; Treas., W. A. Chess. Rept. by Supt., Jos. Combs, Aug. 13, '96. PROJECTED IMPROVEMENTS.—New 10,000,000-gall. reservoir; money in hand. SEWERS.—None.

65. **MONTEREY,** Monterey Co. (1,662.) Supply from Pacific Grove.

—? **MORENO,** Riverside Co. (Not given.) Now supplied by new Bear Valley Irrigation Co., of Redlands. Supplied in '91 by branch steel pipe in connection with Alessandro Irrigation District, which is supplied from Bear Valley Irrigation Co.'s system. About 12 families in town. Rept. by P. C. Hagen.

54. **NAPA,** Napa Co. (4,395.) Built in '83-4 by Napa City Water Co. FRANCHISE.—50 yrs.; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Wells and underground stream in winter and river in summer, by pumping. PUMPS.—Cap., 720,000 galls.; Harper comp. Av. cost of coal used, $7 per short ton, delivered. RESERVOIR.—Cap., 2,500,000 galls.; formed by masonry dam; 100 ft. above city. FISCAL YEAR CLOSED Sept. 18, '95. DISTRIBUTION.—Mains, 12 miles; cost extensions met by Co. with cash. Taps, about 800; made by Co. at $9.50 for ¾-in. Services, galv.i.; paid for by property owner. Meters, about 40; owned, controlled and repaired by Co. Use of meters optional with consumer; compulsory for livery, laundries and hotels. Hydrants, public, 53; private, 2. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, about $160,000. Cap. Stock: Authorized, $150,000; paid-up, $130,000; paid 6.4% div'd in '95. No debt. Revenue: City, fire protection, $1,500; sewer flushing free

to extent of 100,000 galls. per month. MANAGEMENT.—Prest., H. H. Knapp; Treas., Geo. E. Goodman; Supt., T. R. Parker; Ch. Pump. Engr., Geo. N. Beebe. Rept. by Secy., E. S. Churchill, July 8 ,'96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 10, '84.

D 9. **NAPLES,** Santa Barbara Co. (Not given.) Dos Pueblos Water Co. has gravity works supplying 15 families and ranch of 1,400 acres. Prest., Geo. Edwards. Rept. by Geo. A. Mack, Mgr. Naples Improvement Co.

55. **NATIONAL CITY,** San Diego Co. (1,358.) Built in '86-8 by San Diego Land & Town Co. Dam reconstructed and distribution largely increased in '95; Engr., H. N. Savage. FRANCHISE.—Unlimited; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay $1,200 per yr. for fire protection, street sprinkling and tree watering. LEGAL DIFFICULTIES.—Ordinance rates being inadequate Co. brought suit in the U. S. Federal Courts in '95; adverse decision; case appealed. SUPPLY.—Sweetwater River, by gravity from impounding reservoir. Drainage area, 186 sq. miles. RESERVOIR.—Max. cap., 7,700,000,000 galls.; impounding; seven miles from San Diego Bay; area, 720 acres; used chiefly for irrigation. FISCAL YEAR CLOSED July 1. DISTRIBUTION.—Mains, 100 miles. Taps, 1,012; made by Co. at cost. Services, w. i.; paid for by consumer. Meters, 96; owned, controlled and repaired by Co.; yearly rental, $4.20. Co. can compel use of meters and any consumer may have one. Hydrants, public, 38. CONSUMPTION.—(Galls.) av., 6,000,000; max., 16,000,000; min., 100,000 (?). Combined irrigation and domestic supply. PRESSURE.—Ordinary, 20 to 90 lbs. FINANCIAL.—Cost, approx., $1,125,000. Expenses: Operating, $12,000. Revenue, $25,700: Consumers, unmetered, $24,000; metered, $500; City, $1,200. MANAGEMENT.—Receiver, C. D. Lanning; Prest., B. P. Cheney, both of 95 Milk St., Boston, Mass.; Gen. Mgr., Jno. E. Boal; Ch. Engr., H. N. Savage. Rept. by Ch. Engr., July 13, '96. SEWERS.—None. REFERENCE.—Sweetwater Dam, Eng. News, Apr. 7, '88, illus; Oct. 28, '88, and Aug. 15, '95.

—? **NEEDLES,** San Bernardino Co. (Precinct, 748.) Built in '95. "Direct system." Cost, about $20,000. Rept. by Supt., S. J. Lewis, July 28, '96.

56, P 8. **NEVADA CITY,** Nevada Co. (2,524.) Built in '61 by Co. SUPPLY.—South Yuba River, by gravity. RESERVOIRS.—Cap., 1,000,000 galls.; three, 212 ft. above city. DISTRIBUTION.—(In '87.) Mains, 4 miles. Taps, 400. Meters, 4. Hydrants, public, 41. PRESSURE.—Ordinary, 212 ft. head. FINANCIAL.—(In '87.) Cost, $38,000. No debt. Expenses, $4,800. Revenue, $16,100. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, May 30, '85.

PROPOSED MUNICIPAL WORKS.

Oct., '96, city voted $60,000 bonds for works. Owner of private works failed to secure injunction from U. S. Circuit Court to prevent sale of bonds and gave notice of appeal to U. S. Supreme Court. Des. Engr., Fred. M. Miller, Grass Valley. Consult. Engrs., Nusbaumer & Boardman, Oakland. Supply, one reservoir on each side of city, by gravity. Rept. from Des. Engr., Oct., '96. Negotiations were in progress early in '97 for purchase of private works by city.

57. **NIPOMO,** San Luis Obispo Co. (215.) Built in '87 by Nipomo Water Co. SUPPLY.—Mountain springs, by gravity to reservoirs. RESERVOIRS.—Cap., 200,000 galls. DISTRIBUTION.—Mains, 2 miles. Taps, 99. FINANCIAL.—Cost, $23,500. Cap. Stock, $25,000. Debt, $2,000, at 10%. Expenses, $200. Revenue, $1,000: City, fire protection, free. NOTE.—No rept. since '90-1 Manual.

—? **NORDHOFF,** Ventura Co. (244.) Built in '91 by Geo. E. Stewart. Engr., Jno. Berry, Ventura. SUPPLY.—Mountain streams, 3 miles above city, at an elev. of 2,500 ft., by gravity to reservoir. RESERVOIRS.—Cap., 25,000 galls.; storage; ½ mile from town, elev. 160 ft. FINANCIAL.—Cost, $10,000. Floating debt, $1,200. MANAGEMENT.—Rept. by Geo. E. Stewart, Sept. 4, '96. SEWERS.—None.

58. **NORTH SAN JUAN,** Nevada Co. (803.) Small system built in '60 by A. N. Crane (deceased). SUPPLY.—Irrigating ditch, by gravity. DISTRIBUTION.—Hydrants, public, 6. MANAGEMENT.—Rept. by Mrs. Crane.

59. **OAKDALE,** Stanislaus Co. (1,012.) Built in '84 by Co.; afterwards owned by Wallace Ferguson who in turn sold it to Thos. Roberts in '86; bonded in '88 to A. Rand. FRANCHISE.—20 yrs. from '81; does not provide for purchase of works by city. Co. is not exempt from local taxes, and receives no compensation for public service. SUPPLY.—Artesian wells, pumping direct, surplus going to reservoir. PUMPS.—360,000 Dow deep well and 1,000,000 triple action, geared. Wood used. RESERVOIR.—Cap., 80,000 galls. DISTRIBUTION.—Mains, 5 miles; cost extensions met by proprietor. Taps, 135; made by proprietor. Services, ¾-in. w. i.; paid for by consumer. Meters, 0. Proprietor can compel use of meters and any consumer may have one. Hydrants, public, 8. CONSUMPTION.—(Galls.) av., 125,000. PRESSURE.—Ordinary and fire, 40 lbs. FINANCIAL.—First cost, $26,000. Expenses, Operating, $250. Revenue, City, fire protection, free. MANAGEMENT.—Rept. by Supt., A. Rand, Sept. 21, '96. SEWERS.—None.

60, 61. **OAKLAND,** Alameda Co. (48,682.) Built in '66 by Contra Costa Water Co. Supplies San Leandro. FRANCHISE.—Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Two impounding reservoirs, by

gravity for low and pumping for high service. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 Dow comp. cond. Screenings used; av. cost, $3.75 per short ton. FILTERS.—Cap., 10,000,000 (makers report 6,000,000) galls.; Hyatt (New York). RESERVOIRS.—Cap., 6,201,970,000 galls. Impounding: San Leandro Lake (artificial), 6,000,000,000; Temescal Lake, 200,000,000. High service; distributing: Highland Park Reservoir, 1,370,000; 120 ft. head. Diamond's Reservoir, 600,000; 247 ft. head. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 256 miles; cost extensions met by collecting advance rentals. Taps, 16,000; made by Co., free, including service, in city; in county, $7.50 for short and $10 for long service. Services, ¾-in. galv. l.; paid for by owner. Meters, about, 500; owned, controlled and repaired by Co. Co. can compel use of meter in case of waste and any consumer not rated in schedule may have one. Hydrants (in '91), 249. CONSUMPTION.—(Galls.) av., 10,000,000; max., 16,000,000; min., 7,000,000. PRESSURE.—Ordinary, 50 lbs. Steam fire engines are used. FINANCIAL.—Cost, $7,800,000. Cap. Stock: Authorized, $6,000,000; paid-up, $3,000,000; paid 6% div'd in '95. Debt, $1,828,500: Floating, $28,500, at 6%; Bonded, $1,800,000, at 5%; due in 1915. Expenses, $181,583: Operating, $74,168; int., $88,757; taxes, $18,608. Revenue, "data not accessible at present." MANAGEMENT.—Prest. and Gen. Mgr., Henry Pierce; Secy., Wm. H. Mead; Supt. of Street Mains, F. Prindle; Ch. Pump. Engr., Wm. Killips. Rept. by Treas., Robt. S. Knight, June 8, '96. PROJECTED IMPROVEMENTS.—Supply of Berkeley and Alameda, now in process of negotiation. SEWERS.—Has storm sewers. REFERENCES.—Eng. News, Apr. 8, '82; asphalt reservoir lining, June 11, '96; reservoir failure, Nov. 5, '96, illus.

OAKLAND WATER CO.

Apparently succeeded by, or consolidation of other interests with, Piedmont Springs Water & Power Co., which began supplying water in '92. Oakland Water Co. incorp. late in '93. PUMPS.—Cap., 9,000,000 galls.; 2—4,500,000 Allis hor. cross-comp. (rept. by makers). RESERVOIR.—Cap., 4,000,000 galls. covered; wall failed latter part of '96. (There may be other reservoirs.) FINANCIAL.—Cap. Stock (in '93), $3,000,000. Expenses, $117,193: Operating, $47,987; int., $57,258; taxes, $9,522; misc., $2,426. Revenue, $114,628: Consumers, $99,620; bills payable and sundry accounts, $15,008. MANAGEMENT.—Prest., W. J. Dingee; Secy., Andrew W. Rose. Information from press repts., that under financial and management being from annual rept. by Co. to city, as published in local paper.

62. **OCEANSIDE,** San Diego Co. (Precinct, 427.) Owned by city since Jan., '90; built in '86 by Oceanside Water Co. SUPPLY.—Wells in bottom of San Luis River, pumping to reservoirs. PUMPS.—Cap., 250,000 galls.; McGowan dup. Crude petroleum used. RESERVOIRS.—Cap., 250,000 galls.; 50,000 and 200,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by general fund. Taps, 200; made by city. Services, ¾-in.; paid for by city. Meters: 40; owned, controlled and repaired by city; yearly rental, none. Use of meters optional with city; compulsory for hotels, manufacturers and irrigation. Hydrants, public, 12; private, 3. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—Ordinary, 40 lbs.; fire, 50 lbs. FINANCIAL.—Cost, $12,500. Expenses, Operating, $3,000. Revenue, $3,600. MANAGEMENT.—Rept. by Supt. and Ch. Pump. Engr., J. F. Clewett, June 21, '96. SEWERS.—None.

63. **ONTARIO,** San Bernardino Co. (683.) Bought in '92 by city; built in '83 by Ontario Water Co. There were no fire hydrants in '90, but city has evidently extended system for general supply, and made other important improvements in and since '92. No response to inquiries.

D 10. **ORANGE VALE,** Sacramento Co. (Not given.) Built by Orange Vale Water Co., under 50-yr. franchise from '96. No legal difficulties. Gravity supply from reservoir. Taps, not given. Prest., H. J. Parks; Secy. and Treas., W. W. Lane. Rept. by Co., Oct. 20, '96.

64. **OROVILLE,** Butte Co. (1,787.) Built in '78 by Oroville Water Co. SUPPLY.—West Branch of Feather River, by gravity through ditch to reservoir. Supply purchased from Thermalito Colony Co. RESERVOIR.—Cap., 2,000,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 400. Meters, 1. Hydrants, 47. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—(In '89.) 70 lbs. FINANCIAL.—Cost, $40,000. Cap. Stock: Authorized, $50,000; paid-up, $40,000. No debt. Expenses, $3,110: Operating, $3,000; int., $110. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, June 13, '85.

65. **PACIFIC GROVE,** Monterey Co. (1,336.) Built in '83 by Pacific Improvement Co. SUPPLY.—Carmel River, impounded, by gravity to reservoirs. Impounding dam is 428 ft. above sea level. From it 20 miles of 18, 15 and 12-in. pipe convey water to a 140,000,000-gall. reservoir, 285 ft. above sea; 2½ miles below there is a 16,000,000-gall. reservoir at an elevation of 208 ft., from which a 12 and an 8-in. supply main lead. CONSUMPTION.—(Galls.) av., 1,500,000. FINANCIAL.—Cost, $2,000,000. MANAGEMENT.—Rept. by Supt., B. A. Eardley, Sept. 19, '96. Probably includes irrigation works.

P 9. **PALO ALTO,** Santa Clara Co. (Not given.) Dec. 14, '96, C. E. Moore, Santa Clara, rept. he was Engr. for proposed city works. Supply, artesian wells, lifted by 425,000-gall. pump to two tanks on wood trestles 100 ft. high. Est. cost, $40,000. Mar.,

'97, press rept. stated $40,000 bonds had been sold and contract let to C. D. Vincent, San Francisco, for $38,991; also that suit had been brought to prevent issuance of bonds.

66, 67, 68, D 11. **PASADENA,** Los Angeles Co. (4,882.)

NORTH PASADENA LAND & WATER CO.

Built in '69-71. Supplies South Pasadena. SUPPLY.—Arroyo Seco and branches, by gravity through tunnels to reservoirs and by pumping from well to reservoirs. Crude oil used. RESERVOIRS.—(In '89.) Cap., 1,200,000 galls.; 450,000 and 750,000. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 25 miles; cost extensions met by revenue and bonds. Taps, 600; made by consumer. Services, iron; paid for by consumer. Meters: 550; owned, controlled and repaired by Co.; yearly rentals, none. Use of meters compulsory for domestic use. CONSUMPTION.—(Galls.) av., 800,000. FINANCIAL.—Cost, $100,000. Cap. Stock: Authorized, $90,000; paid-up, $75,000; paid no div'd in '95. Bonded debt, $50,000 at 7%; due $1,000 yearly from '99 to 1903; $2,000 yearly from 1904 to '06, $3,000 yearly from 1905 to '13, and $4,000 yearly from 1914 to '18. Expenses, $7,403: Operating, $4,975; int., $2,336; taxes, $92. Revenue, Consumers, metered, $8,609. MANAGEMENT.—Prest., M. D. Painter; Secy., Ira S. Frame; Supt., M. H. Salisbury. Rept. by Co., Sept. 29, '96. SEWERS.—Has sanitary sewers.

PASADENA LAND & WATER CO.

Built in '74 by a Co. Pasadena Land & Water Co. came into possession in '83. Supplies only the western portion of city and nearly all of South Pasedena. FRANCHISE.—50 yrs. from '83; does not provide for purchase of works by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Springs in Arroyo Seco, pumping from tunnels to distributing reservoir. PUMPS.—Cap., 2,000,000 galls.; 750,000 cond. and 1,250,000 non-cond. Worthington comp. Oil used. RESERVOIRS.—Cap., 5,500,000 galls.; 4,500,000 and 1,000,000. FISCAL YEAR CLOSED Mar. 31. DISTRIBUTION.—Mains, 12 miles; cost extensions met by revenue. Taps, 1,000; made by Co. Services, "dipped steel;" paid for by property owner. Hydrants, public, 20. CONSUMPTION.—(Galls.) max., 1,500,000 (May to Nov.); min., 600,000 (Nov. to May). PRESSURE.—Ordinary, 30 to 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $150,000. Cap. Stock: Paid-up, $75,000; paid no div'd in '95. Bonded debt, $45,000 at 7%; due in one to 20 yrs. Sinking Fund, none. Expenses, $18,-604: Operating, $15,000; int., $3,071; taxes, $533. Revenue, $20,549: Consumers, domestic and irrigation, $18,177; street sprinkling, $1,377; other purposes, $995. Revenue pays all expenses. MANAGEMENT.—Prest., A. K. McQuilling; Treas., S. Washburn; Supt., E. Gardner; Ch. Pump. Engr., C. H. Hovey. Rept. by Secy., H. G. Bennett, July 8, '96. PROJECTED IMPROVEMENTS.—Tunnelling for additional water. SEWERS.—Has sanitary sewers only.

PASADENA LAKE VINEYARD LAND & WATER CO.

Built in '83 by Lake Vineyard Land & Water Assoc., under 50-yrs. franchise, to supply stockholders only. Supplies the eastern portion of the city. No legal difficulties. SUPPLY.—Springs at Devil's Gate, about three miles from city, by gravity. RESERVOIRS.—Cap., 27,000,000 galls.; 6,000,000 and 21,000,000. FISCAL YEAR CLOSED Feb. 10. DISTRIBUTION.—Mains, about, 75 miles; cost extensions met by rentals. Taps made by consumer for 25 cents fee. Services, black i.; paid for by consumer. Meters: 25; owned and repairs paid by consumer; controlled by Co. Use of meters optional with consumer; compulsory for laundries, liveries, hotels and public works. Hydrants, public, 90. CONSUMPTION.—(Galls.) av., 3,000,000. PRESSURE.—Ordinary, 30 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, $250,000. MANAGEMENT.—Prest., C. M. Parker; Treas., San Gabriel Valley Bank; Supt., A. H. Ninde. Rept. by Secy., Jno. Habbick, July 9, '96. PROJECTED IMPROVEMENTS.—Submerged dam at Devil's Gate, across Arroyo Seco, and tunnelling for development of supply.

MOUNTAIN WATER CO.

Built in '96 for domestic supply; fire hydrants will probably be added. Supply, tunnels in Pacific Canyon, by gravity. Cost, $38,000. Rept. by Prest., Geo. B. Post, Oct. 28, '96.

69. **PASO ROBLES,** San Luis Obispo Co. (827.) Built in '87-8 by Paso Robles Water Co. SUPPLY.—Springs, by gravity to reservoir. In '91 driven well was being sunk. RESERVOIR.—Cap., 150,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 150. Meters, 15. Hydrants, 10. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—(In '89.) Ordinary, 100 lbs.; fire, 126 lbs. FINANCIAL.—Cost, $25,000. Cap. Stock, Authorized, $30,000; paid-up, $25,000; paid $3,500 div'd in '90. Floating debt, $500. Expenses, $202: Operating, $150; taxes, $52. Revenue, $4,800: Consumers, $4,000; City, fire protection, free; other purposes, $800. NOTE.—No rept. since '90-1 Manual.

70. **PETALUMA,** Sonoma Co. (3,692.) Built in '71 by Sonoma County Water Co. SUPPLY.—Mountain streams, by gravity from impounding to distributing reservoir. RESERVOIRS.—Cap., 52,500,000 galls. Distributing: 2,500,000; 175 ft. above town. Impounding: 50,000,000; area, 8 acres; depth, 25 ft. Supply conduit, cast iron, 9 miles in length. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 4 miles. Taps, 800. Hydrants, public, 44. FINANCIAL.—Cost, $180,000. Floating debt, $5,000 at 5%. Ex-

penses, $7,550: Operating, $6,000; int., $250; taxes, $1,300. Revenue, $20,000. MANAGEMENT.—Prest., H. E. Lawrence; Secy. and Supt., Chas. H. Egan. REFERENCE.—Eng. News, Apr. 1, '82.

71. **PLACERVILLE**, El Dorado Co. (1,690.) Built in '52 by Placerville Water Co. SUPPLY.—Mining canal, by gravity to reservoirs. RESERVOIRS.—Cap., 500,000 galls.; two. DISTRIBUTION.—(In '86.) Mains, 3.5 miles. Hydrants, 18. NOTE.—No rept. since '90-1 Manual.

P 10. **PLEASANTON**, Alameda Co. (Est., 984.) Press rept., Feb., '97, stated water would be introduced by Livermore Water & Power Co., and that surveys would be made at once.

72. **POMONA**, Los Angeles Co. (3,634.) Consolidated Water Co. formed in '96 and absorbed Pomona Water-Works Co., which built works in '82-3, and Citizens Water Co., which built in '89. FRANCHISE.—Perpetual. Co. is not exempt from local taxes. City to pay in part for public service. SUPPLY.—Subterranean stream, tapped by a tunnel, about 100 ft. below surface, by gravity. Old cos. were supplied by artesian wells. DISTRIBUTION.—Mains, about 50 miles; cost extensions met by revenue. Taps, 1,500; made by Co. at cost. Services, ¾-in. w. i.; paid for by property owner. Meters: 33; owned by Co. and consumers; controlled and repaired by Co; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 88; private, 2. CONSUMPTION.—(Galls.) av., 1,300,000; max., 1,600,000; min., 1,000,000. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $350,000. Cap. Stock, authorized: $500,000; all paid-up. Bonded debt, $175,000 at 6%; due in 20 yrs. in gold. MANAGEMENT.—Prest., A. C. Moorhead; Secy., J. A. Young; Treas., Jas. Becket; Supt., Peter Fleming. Rept. by Vice-Prest., G. A. Lathrop, Sept. 21, and Treas., Nov. 2, '96. SEWERS.—None.

73. **PORTERSVILLE**, Tulare Co. (606.) Built in '88 by Pioneer Land Co., San Francisco. SUPPLY.—Tule River, by gravity to pump, thence by pumping to stand-pipe and tank. PUMP.—Cap., 500,000 galls.; water-power, from J. B. Jardine. FILTERS.—Cap., 150,000 galls.; National (New York). TANK.—Cap., 30,000 galls. DISTRIBUTION.—Mains, 2.3 miles. Taps, 61. Hydrants, 7. CONSUMPTION.—(Galls.) av., 60,000. FINANCIAL.—Cost, $15,000. No debt. Expenses, $500. Revenue, $2,000. NOTE.—No rept. since '90-1 Manual.

74. **RED BLUFF**, Tehama Co. (2,608.) Present works built in '80 by Antelope Creek & Red Bluff Water Co.; small system was built in '61 by Co. SUPPLY.—Antelope Creek, 9 miles east of city, by gravity, with pumping from Sacramento River as an auxiliary supply. PUMP.—Cap., 240,000 galls.; Hooker. TANKS.—Cap., 200,000 galls.; four. DISTRIBUTION.—Mains, 18 miles. Taps, 300; made by Co. for $8. Services, galv. i.; paid for by consumer. Use of meters optional with consumer. Hydrants, public, 30. CONSUMPTION.—(Galls.) max., 1,000,000; min., 600,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $150,000. Cap. Stock: authorized, $150,000; all paid-up. No debt. Expenses, $4,000. Revenue, $10,000. MANAGEMENT.—Prest., J. H. Jewett; Secy., W. B. Cahoone; Treas., Bank of Tehama Co. Rept. by Supt., Chas. T. Cadwallader, June 9, '96. SEWERS.—Has partial sanitary sewers. REFERENCE.—Eng. News, Mar. 3, '83.

75. **REDDING**, Shasta Co. (1,821.) Built in '86 by Redding Water Co. SUPPLY.—Sacramento River, pumping to reservoir 197 ft. above river. PUMPS.—Cap., 1,000,000 galls.; water-power. DISTRIBUTION.—Mains, 9.8 miles. Taps, 460. Meters, 95. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 1,300,000. PRESSURE.—(In '89.) Ordinary, 135 lbs. FINANCIAL.—Cost, $60,000. No debt. Expenses, $2,900. Revenue, $9,720. MANAGEMENT.—Prest., Francis Smith; Secy., M. L. Fillman. Supt., S. P. Fillman.

76. **REDLANDS**, San Bernardino Co. (1,904.) Built in '87-8 by Redlands, Lugonia & Crafton Domestic Water Co. FRANCHISE.—Co. is not exempt from local taxes. City to pay for public service. LEGAL DIFFICULTIES.—Two different suits against city to set aside ordinance fixing rates; still pending in Supreme Court. SUPPLY.—Bear Valley reservoir, by gravity, to and from distributing reservoirs. RESERVOIRS.—Cap., 7,000,000 galls.; two distributing; 6,500,000 and 500,000. Bear Valley Reservoir has cap. of 8,623,000,000 galls., with 53 ft. of water at dam. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 30 miles; cost extensions met by borrowing. Taps, 750; made by Co. for $10. Services, iron; paid for by consumer. Meters: 220; owned, controlled and repaired by Co.; yearly rental, none. Co. can compel use of meters and any consumer may have one. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 1,600,000; max., 4,500,000; min., 800,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $336,000. Cap. Stock: authorized, $500,000; paid-up, $226,000. Debt, $94,000: Floating, $19,000 at 8%; Bonded, $75,000 at 7%; due in 1900. Expenses, $9,885: Operating, $1,562; int., $6,883; taxes, $1,440. Revenue, City, fire protection, $360; street sprinkling, $500; sewer flushing, $180. MANAGEMENT.—Prest., Geo. A. Cook; Secy., S. Williams; Treas., First Natl. Bank; Rept. by Supt., Halsey W. Allen, July 10, '96. REFERENCES.—Bear Valley dam, Eng. News, Apr. 7, June 23, '88; Nov. 23, 30, '89.

77. **REDONDO BEACH** (P. O. Redondo), Los Angeles Co. (603.) Built in '87-8 by Redondo Beach Co. FRANCHISE.—Rates are subject to regulation by city council if not

earnings exceed 6% int. on capital. No legal difficulties. SUPPLY.—Thirty-two 2-in. driven wells, 16 to 20 ft. deep, pumping to reservoir. PUMPS.—Cap., 720,000 galls.; Worthington. Crude oil used; av. cost, 3 cts. per gall. RESERVOIR.—Cap., 500,000 galls.; elev., 160 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 9 miles; cost extensions charged to water development account. System is adjunct to land co.; not a co. in itself. Taps, made by Co., with service of 60 ft. or less for $10. Services paid for by consumer. Meters: 18; owned, controlled and repaired by Co. Use of meters optional with Co. Hydrants, public, 16; private, 5. CONSUMPTION.—(Galls.) av., 200,000; max., 270,000. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $49,818, including reservoir. Not capitalized as a water co. Expenses, Operating, $2,496. Revenue, Consumers, $5,578. MANAGEMENT.—Prest., L. T. Garnsey, Los Angeles; Secy. and Treas., H. B. Ainsworth; Supt., L. J. Perry; Ch. Pump. Engr., J. P. Call. SEWERS.—Partial system of sanitary and storm sewers.

78. **REDWOOD CITY,** San Mateo Co. (1,572.) Built in '77 by town. SUPPLY.—Salinas Gas & Water Co.'s system, pumping to tanks. PUMPS.—Cap., 600,000 galls.; Thompson & Evans. TANKS.—Cap., 128,000 galls.; three. DISTRIBUTION.—Mains, 4 miles. Taps, 270. Meters, 50. Hydrants, 50. CONSUMPTION.—(Galls.) av., 70,000. FINANCIAL.—No debt. Expenses, $6,000. Revenue, $7,000. NOTE.—No rept. since 90-1 Manual.

79. **RIO VISTA,** Solano Co. (648.) Built in '75 by Co.; all stock owned by Prest. FRANCHISE.—Perpetual. Co. is not exempt from local taxes. City to pay $50 per hydrant per yr. No legal difficulties. SUPPLY.—Sacramento River, pumping to tanks, 2,600 ft. distant. PUMP.—Cap., 100,000 galls.; Buffalo dup. Wellington coal screenings used; av. cost, $5.34 per short ton. TANK.—Cap., 70,000 galls.; wood; 100 ft. above river. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 2¼ miles; cost extensions met by Co. Taps, 91; made by Co., free. Services, iron; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 10. CONSUMPTION.—(Galls.) av., 40,000; min., 4,500. PRESSURE.—Ordinary and fire, 43 lbs. FINANCIAL.—Cost, $6,200. Cap. Stock: Authorized, $5,000; all paid-up. No debt. Expenses: Operating, $1,614. Revenue, $1,608: City, fire protection, $50; other purposes, $1,558. MANAGEMENT.—Secy., R. D. Carter. Rept. by Prest. and Supt., R. C. Carter, Nov. 8, '96. SEWERS.—None.

80, 81. **RIVERSIDE,** Riverside Co. (4,683.)

RIVERSIDE WATER CO.

Built in '86-7; a mutual Co., owned by consumers. Press rept. stated receiver was appointed in '95. FRANCHISE.—Co. is not exempt from local taxes. City to pay for public service; contract independent of franchise, expires July 1, '97. No legal difficulties. SUPPLY.—Artesian wells, 8 miles northeast of city, by gravity. RESERVOIR.—Small distributing. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 40 miles; cost extensions met jointly by income and advance payments by consumers. Taps, 700; made by Co. for $10 fee. Services, iron; paid for by consumer. Meters, 377; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for large consumers. Co. can compel use of meters and any consumer may have one. Hydrants, public, 47. Water is also used for irrigation. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $1,291,136, including irrigating system. Cap. Stock: Authorized, $240,000; paid-up, $185,996; paid no div'd in '95. Bonded debt, $812,000, at 6%; due in 1912. Sinking Fund, $462,542. Expenses, $75,371: Operating, $21,225; int., $48,720; taxes, $5,426. Revenue, $76,051: City, fire protection, $959; street sprinkling, $902; sewer flushing, $144; other purposes, $74,046. MANAGEMENT.—Prest., Geo. Frost; Treas., Orange Growers' Bank; Supt., Francis Cuttle; Ch. Pump. Engr., G. O. Newman. Rept. by Secy., Wm. A. Correll, July 9, '96. SEWERS.—Has sanitary sewers only.

HALL'S ADDITION WATER CO.

Built in '87-9 by Hall's Addition Water Co. No Engr. nor Contr. FRANCHISE.—50 yrs. SUPPLY.—Gage canal, fed by artesian wells, by gravity to reservoir. FILTERS.—Cap., 85,000 galls.; Hyatt (New York). RESERVOIR.—Cap., 5,000,000 galls. DISTRIBUTION.—Mains, 25 miles. Taps, 400. Meters, 1. Hydrants, public, 5. PRESSURE.—Ordinary, 40 to 110 ft. head. FINANCIAL.—Cost, $65,000. Cap. Stock: Authorized, $100,000; paid-up, $48,000. Debt, $20,000, at 8% and 10%. Bonds, $20,000 authorized, but not sold. Expenses, Operating, $3,000. Revenue, $6,200: Consumers, $6,000; City, fire protection, $200. MANAGEMENT.—Prest. and Supt., Jno. A. Simms. Rept. by Secy., Achilles Martin, Jan. 26, '97. SEWERS.—Has sewers.

82. **ROCKLIN,** Placer Co. (1,056.) Built since '90 by Yuba Water Co. FRANCHISE.—City to pay $500 per yr. for public service. SUPPLY.—Bear River irrigation ditch, then 5 miles through 11-in. pipe, by gravity. DISTRIBUTION.—Mains, 5 miles. Meters, 0. Hydrants, public, 13. PRESSURE.—Ordinary, 85 lbs. MANAGEMENT.—Prest. of South Yuba Water Co., Auburn, Wm. Spaulding. Rept. by Geo. Good, Jan. 20, '97. SEWERS.—None.

83. **SACRAMENTO,** Sacramento Co. (26,386.) Built in '54 by city. SUPPLY.—Sacramento River, pumping direct. PUMPS.—Cap., 13,000,000 galls.; 3,000,000 Holly quad.; 5,000,000 Allis vert. comp.; 5,000,000 Stevens. Iowa bituminous coal used;

av. cost, $1.75 per short ton. FISCAL YEAR CLOSED Jan. 1. DISTRIBUTION.—Mains, 38 miles; cost extensions met by water fund or general fund. Taps, 7,200; made by city. Services, iron; paid for by property owner. Meters, 0. Hydrants, public, 407. CONSUMPTION.—(Galls.) av., 6,000,000; max., 12,000,000; min., 4,000,000. PRESSURE.—Ordinary, 80 lbs.; fire, 55 lbs. Four steam fire engines are used. FINANCIAL.—No debt. Expenses, Operating, $35,000. Revenue, $103,000. MANAGEMENT.—Supt. and Ch. Pump. Engr., H. C. Wolf. Rept. by Mayor, C. H. Hubbard, Nov. 6, '96. PROJECTED IMPROVEMENTS.—New 5,000,000-gall. Allis pump and new boilers were being installed and works being rebuilt at time of rept.; about $100,000 will soon be spent for extensions. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 28, '82.

84, P 11. **SAINT HELENA,** Napa Co. (1,705.) Built in '77-8 by Saint Helena Water Co. SUPPLY.—Spring, by gravity. RESERVOIR.—Cap., 30,000,000 galls. DISTRIBUTION.—Mains, 10 miles. Taps, 200. Hydrants, 26. PRESSURE.—(In '89.) 65 lbs. FINANCIAL.—Cost, $40,250. Cap. Stock: Authorized, $50,000; paid-up, $40,250; paid $2,415 div'd in '90. No debt. Expenses, $1,375, Operating, $1,200; taxes, $175. Revenue, $4,812: Consumers, $4,500; City, fire protection, $312. NOTE.—No rept. since '90-1 Manual.

PROPOSED MUNICIPAL WORKS.

Jan., '97, J. M. Graham, Cy. Engr., rept. town was talking of building works, but had taken no definite action.

85. **SALINAS,** Monterey Co. (2,339.) Old Co. absorbed Oct., '96, by Salinas City Light & Water Co.; built in '74-5 by Salinas Gas & Water Co. SUPPLY.—Seven artesian wells, pumping to tanks. PUMP.—Cap., 1,000,000 galls.; Worthington comp. dup. TANKS.—Cap., 130,000 galls.; two, each 90,000 and one 40,000. DISTRIBUTION.—Mains, 8¼ miles. Taps, 392. Meters, 0. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 225,000. PRESSURE.—(In '89.) Ordinary, 31 lbs.; fire, 40 lbs. FINANCIAL.—Cap. Stock, $60,000. No debt. Expenses and revenue of gas and water plants are not kept separately. MANAGEMENT.—Prest., J. B. Iverson; Treas., Wm. Vanderhurst; Supt., Frank B. Day. Rept. by Secy. H. J. Wilke, Sept. 25, '96. REFERENCE.—Eng. News, July 8, '82.

86. **SAN BERNARDINO,** San Bernardino Co. (4,012.) Built in '90 by city. SUPPLY.—Artesian wells, by gravity to reservoir. Press rept., June, '98, stated city had made 20-yr. contract with Jno. L. Campbell for 100 miner's ins. of water from Campbell Creek, at $4,950 per yr., after first yr. RESERVOIR.—Cap., 1,000,000 galls.; covered; 230 ft. above and 3 miles from city. DISTRIBUTION.—Mains, 22.8 miles. Services, galv. 1. Meters, 3. Hydrants, 70. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—100 lbs. FINANCIAL.—Cost, $130,000. Bonded debt, $135,000 at 6%. SEWERS.—Has sewers. NOTE.—No rept. since '90-1 Manual.

87, P 12. **SAN DIEGO,** San Diego Co. (16,159.) Owned by San Diego Water Co. since Aug., '89. Built in '73 by San Diego & Coronado Water Co. FRANCHISE.—Does not provide for purchase of works by city, but in '91 city leased plant for 20 yrs., from June 1, with option of purchase at any time at actual cost. It appears that this lease was afterwards cancelled. SUPPLY.—Lake Cuyamaca, by gravity, with supplementary pumping. PUMPS.—Makers rept. 1,000,000 Worthington, 3,000,000 and 2,000,000 Holly-Gaskill hor. high duty. RESERVOIR.—Lake Cuyamaca: Cap., 2,570,820,000 galls.; area 804 acres. Water flows from reservoir 12 miles through Boulder Creek, and is diverted to flume of San Diego Flume Co. at point ⅛ mile above junction of creek with San Diego River. DISTRIBUTION.—Mains, 60.3 miles. Taps, 2,394. Meters, 1,252. Hydrants, 186. CONSUMPTION.—(Galls.) av. 651,000. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $1,938,197. Cap. Stock, authorized, $1,000,000; all paid-up; paid no div'd in '90. Bonded debt, $1,000,000 at 5%; due 1909. Expenses, $98,004: Operating, $42,320; int., $50,000; taxes, $5,684. Revenue, $94,384: Consumers, $67,018; fire protection, $18,557; other purposes, $8,809. MANAGEMENT.—(Jan., '97.) Prest., J. M. Howells; Secy., Jos. A. Flint. SEWERS.—Has sewers. NOTE.—No official rept. since '90-1 Manual. Press rept., Feb., '97, gives abstract of Cos. annual rept. to city, from which following figures are taken: Expenses, $119,927: operating, $58,883; int., $50,000; taxes, $10,044. Revenue, $104,191: Consumers, $80,105; City, fire protection, $17,164; street sprinkling, and sewer flushing, $2,743; taps, meters and misc., $4,178. REFERENCE.—Eng. News, June 24, '82.

PROPOSED MUNICIPAL WORKS.

June 27, '96, by 57 more than ⅔ majority, city voted $1,500,000 bonds for works. Vote was in ratification of conditional contract with South Mountain Water Co. for construction of works. Supply, 12,950,000 galls. per day, from 4,740,000,000-gall. impounding reservoir on Cottonwood Creek, by gravity to four distributing reservoirs, with aggregate cap. of 8,500,000 galls. Dam will be rock fill, with asphalt face, about 50 miles from San Diego and will impound water from drainage area of 130 sq. miles. For map of drainage area and pipe line, with brief description of works, see Eng. News, Aug. 6, '96. Prest., E. S. Babcock. Engrs., Harris & Russell. Rept. by Cy. Engr., E. E. Capps, July, '96. Validity of bond issue was being tested in courts at time of rept.,

but press repts. since indicated that work was in progress on Morena dam, for impounding reservoir.

88. **SAN FRANCISCO,** San Francisco Co. (298,997.) Built in '56-9 by Spring Valley Water-Works Co.; in '57 San Francisco Water-Works Co. was organized, and put works in operation after above co. In '65 two cos. consolidated. Began to supply San Mateo in '71. FRANCHISE.—Co. is not exempt from local taxes. City to pay for public service at regular rates. SUPPLY.—Mountain streams, impounded in four storage reservoirs, by gravity and pumping to five distributing reservoirs and three tanks. Water is screened and aerated when necessary. PUMPS.—Comp. dup. direct acting; cap. not given. A total cap. of 9,000,000 galls., at two stations, was rept. in '89, a 1,000,000 Worthington, lifting water from Lobus Creek, and an 8,000,000 plant, at Lake Merced. Rept. in '91 that 2—3,000,000 Corliss pumps were installed at Lake Merced. IMPOUNDING RESERVOIRS.—Cap., 77,060,000,000 galls. Pilarcitos Creek: 1,080,000,000; elev., 696 ft.; 15 miles from city; drainage area, 5¾ sq. miles, including 2 sq. miles intercepted. Dam of earth, 95 ft. high, 640 ft. long. San Andreas: 7,000,000,000; elev., 455 ft.; drainage area, 10.81 sq. miles. Dam, earth, 93 ft. high, 640 ft. long. Upper Crystal Springs: 8,630,000,000; elev., about 300 ft.; drainage area, 15 sq. miles. Lower Crystal Springs: 30,000,000,000; elev., about 300 ft.; drainage area, 11½ sq. miles. Calaveras: 30,000,000,000; elev., 745 ft.; drainage area 250 (?) sq. miles. DISTRIBUTING RESERVOIRS.—Cap., 90,430,000 galls. Laguna Honda: 33,000,000; elev., 380 ft. University Mound: 33,000,000,000; elev., 160 ft. College Hill: 15,000,000; elev., 252 ft. Lower Russian Hill: 6,700,000; elev., 139 ft. Upper Russian Hill, 3,720,000; elev., 306 ft. TANKS.—Cap., 864,000 galls. Clay Hill: 192,000; elev., 375 ft. Lafayette Square: 108,000; elev., 370 ft. Clarendon Heights: 564,000; elev., 600 ft. FISCAL YEAR CLOSED June 30. DISTRIBUTION.—Mains: Cost extensions met by stock and bonds. Taps, 39,000; made by Co. at cost. Services, lead and iron; paid for by property owner. Meters: 11,000; owned, controlled and repaired by Co.; yearly rental, none. Use of meters compulsory for business and manufacturing purposes. Co. can compel use of meters and any consumer may have one except for family use. Hydrants, public, 3,100. CONSUMPTION.—(Galls.) av., 20,000,000. Steam fire engines are used. FINANCIAL.—Cap. Stock, $16,000,000; paid-up, $1,230,500; paid 6% div'd in '95. Bonded debt, $9,975,000. Sinking Fund, none. Expenses, $1,012,820: Operating, $376,826; int., $533,838; taxes, $102,156. Revenue, $1,686,071: Consumers, $1,548,835; City, fire protection, $137,236. MANAGEMENT.—Prest., Chas. Webb Howard; Secy., Pelham W. Ames; Ch. Engr. and Supt., Hermann F. A. Schussler. Rept. by Ch. Clk., Geo. E. Booker, Sept. 21, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 23, '81; San Mateo dam and reservoir, Mar. 2, '89.

89. **SAN GABRIEL,** Los Angeles Co. (737.) Owned by E. K. Alexander; built in '87-8 by San Gabriel Valley Land & Water Co. Sold to H. H. Markham, and by him to E. K. Alexander, including entire plant and 250 acres of land. Plant has been extended and improved by present owner. SUPPLY.—Wells and 2,000 ft. of tunnels, by gravity to and from reservoir. DISTRIBUTION.—Mains, 7 miles. Meters, 0. The water supply is used more for promotion of sales of land than for profit. MANAGEMENT.—Rept. by owner, E. K. Alexander, Los Angeles, Sept. 23, '96.

P 13. **SANGER,** Fresno Co. (428.) Oct. 5, '96, Geo. P. Low, Lessee Sanger Electric Light Co., rept. he had secured steam plant and pump, and in '97 proposed to construct works for domestic supply, and probably for fire protection. Supply, artesian wells, pumping to tank.

90. **SAN JACINTO,** Riverside Co. (661.) Present works built in '96 by city; put in operation in June. Engr., E. F. Tabor, Escondido. Contrs., Baker Iron Wks. and J. D. Hooker Co., both of Los Angeles. In '91 San Jacinto Water Co. owned and operated small plant. Rept. states city works "take place of old system, under private ownership." SUPPLY.—Three 7-in. artesian wells, 186 to 350 ft. deep, within city limits, pumping to tank, and direct for fire protection. PUMP.—Cap., 1,500,000 galls.; Worthington comp. cond. Crude oil used; av. cost, $1.75 per bbl. TANK.—Cap., 50,000 galls.; redwood on wooden tower, 36 ft. high. DISTRIBUTION.—Mains, 6 miles. Taps made by city. Services, iron; paid for by consumer. Meters, 0. Water for irrigation is sold by cu. ft. per sec., weir measure. Hydrants, public, 6. PRESSURE.—Ordinary, 25 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $24,000. Bonded debt, $37,625 at 6%; due in 5 to 40 yrs. from date, in equal annual payments. MANAGEMENT.—Chn. of Council, L. A. Hemmenway; City Clk., Geo. Phar; Treas., L. A. Wright; Ch. Pump. Engr., Chas. Chambers. Rept. by E. F. Tabor, June 24, '96. SEWERS.—None. REFERENCE.—Pumping experiments, Eng. News, Oct. 15, '96.

91. **SAN JOSE,** Santa Clara Co. (18,060.) Built in '65 by San Jose Water Co. SUPPLY.—Mountain streams, by gravity from impounding to distributing reservoirs and artesian wells by pumping, as supplementary supply. PUMPS.—Cap., 7,850,000 (?) galls.; Knowles comp. and 850,000 Dow rept. in '89; makers rept. 5,000,000 Holly-Gaskill hor. high duty added in '96. RESERVOIRS.—Cap., 158,000,000 galls.: Impounding; three; cap. 15,000,000; distributing; three; cap. 8,000,000. DISTRIBUTION.—Mains, 66 miles. Taps, 3,600. Meters, 12. Hydrants, 154. FINANCIAL.—First cost, $413,500. Cap. Stock, $1,000,000. Expenses, taxes, $7,000. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, July 7, '83.

60. **SAN LEANDRO,** Alameda Co. (Est., 1,879.) Supply from Oakland.

92, P 14. **SAN LUIS OBISPO,** San Luis Obispo Co. (2,995.) Built in '74 by San Luis Water Co. FRANCHISE.—25 yrs. from '72; provides for purchase of works by city in '05, price to be determined by appraisers. Rates are not fixed in franchise but must not be over 15% cost of constn. Co. is not exempt from local taxes and receives no compensation for public service. LEGAL DIFFICULTIES.—See below. SUPPLY.—San Luis Obispo and Filmore Creeks, by gravity from impounding to distributing reservoir. RESERVOIRS.—Cap., 5,800,000 galls.; impounding: 5,000,000; distributing, 800,000; 150 ft. above and two miles from town. FISCAL YEAR CLOSED Feb 1. DISTRIBUTION.—Mains, about 14 miles; cost extensions met by revenue. Taps, 643; made by Co. for $10. Services, iron; paid for by property owner. Meters, 0. Hydrants, public, 27. CONSUMPTION.—(Gall.) av., 400,000; max., 500,000; min., 300,000. PRESSURE.—Ordinary, 35 lbs. One steam fire engine is used. FINANCIAL.—Cost, $118,114. Cap. Stock: authorized, $60,000; all paid up; paid div'd in '95 of $2,400. No debt. Expenses, Operating, $3,000. Revenue, Consumers, $10,696; sewer flushing, $75; public building, $18. MANAGEMENT.—Prest., P. W. Murphy, Santa Margarita. Rept. by Secy. and Supt., C. A. Haskin, July 10, '96. SEWERS.—Has partial sanitary sewers only. REFERENCE.—Eng. News, Aug. 1, '85.

PROPOSED MUNICIPAL PLANT.

City voted $90,000 bonds for works in Sept., '96. Feb., '97, Co was contesting issue of bonds. Supply, wells, pumping to reservoir. Probable cost, $90,000; bonds not sold at time of rept. Rept. by E. P. Mangat, Prest. Bd. of Trustees, June 13, '96.

88. **SAN MATEO,** San Mateo Co. (Est., 1,016.) See San Francisco.

D 12. **SAN MIGUEL,** San Luis Obispo Co. (458.) Press rept. states works were bought in '92 by A. F. & T. P. Gorham; built in '89 by L. D. Murphy. Franchise, 25 yrs. Supply, well, lifted by 360,000-gall. Hooker pump to 150,000-gall. reservoir. Mains, 1 mile. Taps, 60. Pressure, 100 lbs. Cost, $5,000. No debt. Expenses, $600. Revenue, $1,200. No official rept. since '90-1 Manual.

119. **SAN PEDRO,** Los Angeles Co. (1,240.) Supply from Wilmington. Press rept., Oct., '96, stated new Co. was being formed.

98. **SAN RAFAEL,** Marin Co. (3,290.) Built in '71 by Marin County Water Co. SUPPLY.—Mountain Lake, area, 22 acres, by gravity. RESERVOIRS.—Cap., 11,000,000 galls.; two; 8,000,000 and 3,000,000. DISTRIBUTION.—Mains, 40 miles. Taps, 682. Meters, 40. Hydrants, 40. PRESSURE.—(In '89.) Ordinary, 80 lbs.; fire, 100. FINANCIAL.—Cost, $450,000. Cap. Stock, $600,000; paid up, $300,000; paid 6% div'd in '90. Bonded debt, $135,000 at 5%; due 1907. Expenses, $28,542: Operating, $19,585; int., $6,750; taxes, $2,207. Revenue, $41,311. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 3, '88.

94. **SANTA ANA,** Orange Co. (3,628.) Built in '91 by city; put in operation Oct. 5. Des. Engr., J. P. Leslie. Contr., Baker Iron Works, Los Angeles. Press rept. in '95 stated plant owned by W. P. Spurgeon and leased to C. C. Drake, had been in operation for a number of years. Jan., '97, S. H. Finley, Cy. Engr., rept. this plant had "given way to city works". SUPPLY.—Artesian wells, pumping to storage reservoir and direct. PUMPS.—Cap., 1,250,000 (?) galls.; Worthington comp. dup. (makers rept. instead 2—1,000,000 comp. non-cond.). British Columbia coal formerly used; av. cost, $8 per short ton; oil is used now. RESERVOIR.—Cap., 450,000 galls.; storage, at pumping station. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains, 20 miles; cost extensions met by city and consumers jointly. Taps, 675; made for $6. Services, w. i.; paid for by consumer. City can compel use of meters and any consumer may have one. Hydrants, public, 73. CONSUMPTION.—(Galls.) av., 425,000; max., 600,000; min., 250,000. PRESSURE.—Ordinary, 60 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $75,000. Bonded debt, $45,000 at 6%; due in 15 yrs. Expenses, Operating, $5,600. Revenue, $7,800. MANAGEMENT.—Rept. by Ch. Pump. Eng., E. D. Atwood, July 9, '96. SEWERS.—None.

95. P 15. **SANTA BARBARA,** Santa Barbara Co. (5,864.) Mission Water Co. and De la Guerra Garden Springs Water Co., consolidated Jan., '91, as Santa Barbara Water Co. First works built in '30 by Franciscan monks. De la Guerra Garden Springs Co., built works in '88. SUPPLY.—Mission Creek, by gravity and pumping direct. PUMP.—Cap., 1,000,000 galls.; Worthington comp. cond. (rept. by makers). RESERVOIR.—Cap., 750,000 galls.; 300 ft. above city. DISTRIBUTION.—Mains, 15 miles. Meters, 12. Hydrants, 47. FINANCIAL.—Cap. Stock: authorized, $500,000; paid-up, $200,000. No debt. NOTE.—No official rept. since '90-1 Manual. Oct., '95, Ernest J. S. Purslow, Engr. for Co., rept. preliminary surveys had been made for increased supply, including masonry dam 100 ft. high, near headwaters Santa Ynez River; 15 miles 20-in. pipe; 7,000 ft. tunnel through Santa Ynez Mts.; and power plant. REFERENCE.—Eng. News, June 24, '82.

PROPOSED MUNICIPAL WORKS.

Dec. 28, 96, J. K. Harington, Cy. Engr., rept. that plans and specifications were being made for city works, including conduit from supply tunnel (already driven), and 1,000,000 distributing reservoir. Press repts. state city let contract for pipe and hydrants in

Feb., '97, and would receive bids for reservoir on Mar. 18. In summer of '96 press repts. stated Mr. Harrington had made plans for salt water fire protection and street sprinkling system.

96. **SANTA CLARA,** Santa Clara Co. (2,891.) Built in '96 by city; put in operation Mar. 1. Engr., Chas. E. Moore. Contr., F. Riffle, 77 Columbian Bldg., San Francisco. Previously supplied by San Jose Water Co. SUPPLY.—Artesian wells, pumping to tanks and direct. PUMPS.—Cap., 2,500,000 galls.; 2—1,250,000 Worthington comp. non-cond. Av. cost of fir wood, $4.50 per cord; redwood, $3.55; slabs from mills, $2.55; coal at $6 to $9 per ton, used for banking fires. TANKS.—Cap., 180,000 galls.; 4—45,000 redwood tanks, on 80-ft. steel tower. DISTRIBUTION.—Mains, 16 miles. Taps, 537; made by city for $5 (in beginning over 500 were made free). Services, "dipped iron;" paid for by consumer. Meters, 0. Use of meters optional with city. Hydrants, public, 53. CONSUMPTION.—(Galls.) av., 350,000; max., 600,000; min., 100,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $56,000. Bonded debt, $60,000 at 5%; due $1,500 annually. Expenses, $5,500: Operating, $2,500; int., $3,000. Revenue, Consumers, $8,400. Int. is met by taxation. Revenue goes to general fund and offsets tax. MANAGEMENT.—Prest. Bd. of Trustees, J. B. O'Brien. Rept. by Chas. E. Moore, Cons. Engr., June 26, '96. SEWERS.—Has sanitary sewers only.

97. **SANTA CRUZ,** Santa Cruz Co. (5,596.) Bought by city Jan. 1, '91; built in '76 by Santa Cruz Water Co. In '88 or '89 works were sold to F. A. Hihn, who owned an independent plant, and the two were consolidated. SUPPLY.—Laguna Creek, by gravity through 12 miles of 14-in. sheet-iron pipe to reservoir, and thence to city. RESERVOIRS.—Cap., 65,000,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 39.2 miles. Taps, 1,842. Services, galv. i. Meters, 8. Hydrants, 84. PRESSURE.—100 lbs. FINANCIAL.—Cost, $384,888. Expenses, Operating, $2,872. Revenue, $11,542. MANAGEMENT.—Rept. by Supt., C. B. Byrne, Nov. 15, '96. REFERENCE.—Eng. News, Feb. 3, '88.

98, P 16. **SANTA MONICA,** Los Angeles Co. (1,580.) Built prior to '93 by Santa Monica Water Co. SUPPLY.—Springs and tunnels, by gravity. RESERVOIR.—Cap., 1,250,000 galls. NOTE.—Information from press repts.; no response to inquiries.

PROJECTED WORKS.

City Water Co., incorp. Dec., '96, with authorized cap. stock of $20,000, of which $400 was paid in by D. M. Clark, G. R. Green and others. Press rept. stated Co. would operate principally in south part of city.

99. **SANTA PAULA,** Ventura Co. (1,047.) Built about '93 by Santa Paula Water Co.; probably supplies water for irrigation also. SUPPLY.—Mountain water, by gravity to reservoir. FINANCIAL.—Cost, $82,000. MANAGEMENT.—Prest., N. W. Blanchard. Rept. by Secy., F. M. Vale, Sept. 1, '96.

100, 101. **SANTA ROSA,** Sonoma Co. (5,220.)

CITY'S PLANT.

Built in '96; put partially in operation in June; completed in Dec. Engr. and Contr., Paul B. Perkins, 117 Main St., San Francisco. LEGAL DIFFICULTIES.—Old water co. is still fighting; no settlement made. SUPPLY.—Wells and Santa Rosa Creek, pumping to distributing reservoir. PUMPS.—Cap., 2,000,000 galls.; 2—1,000,000 dup. Wood used; av. cost, $4 per cord. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains, about 26 miles. Taps, 600; made by consumer; no fee. Services, ¾-in. iron; paid for by property owner. Meters, 0. City can compel use of meters and any consumer may have one by rental or purchase. Hydrants, public, 112; every house is provided with 100 ft. of hose. CONSUMPTION.—(Galls.), max., 1,000,000; min., 300,000. PRESSURE.—Ordinary, 65 lbs.; fire, 100 lbs. One steam fire engine is used, but will be discontinued. FINANCIAL.—Cost, $165,000. Debt, $156,750, at 4%. Sinking Fund, none. Expenses, Operating, $5,000. Tax levied to pay bonds and int.; cannot invest. Should any deficit or inordinate expense be incurred the general city fund will be used, and when rentals are charged revenue will be used. MANAGEMENT.—Mayor, Hon. J. W. Jesse. Rept. by Cy. Clk., C. L. Mobley, Dec. 5, '96. SEWERS.—Has sanitary sewers only.

SANTA ROSA WATER CO.

Built in '73. FRANCHISE.—50 yrs. from '73. Co. is not exempt from local taxes. SUPPLY.—Santa Rosa and Alamos Creeks, by gravity. There is a masonry dam at junction of the creeks. From this an 18-in. terra cotta conduit extends 2½ miles to storage reservoir. RESERVOIR.—Cap., 400,000,000 galls.; storage; area, 26 acres; 80 ft. above, two miles from city. DISTRIBUTION.—Mains, 25 miles; cost extensions met by revenue. Taps, 1,000; made by Co. for $4, including service to curb. Services, w. i. Meters, 0. Hydrants, public, 37. PRESSURE.—Ordinary, 35 lbs. Steam fire engines are used. FINANCIAL.—Cost, $175,000. MANAGEMENT. — Prest., Mark L. McDonald; Treas., J. P. Overton. Rept. by Secy. and Supt., M. L. McDonald, Jr., June 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 2, '83.

102. **SAUSALITO,** Marin Co. (1,334.) Built by Sausalito Land & Ferry Co., "an old concern," for general supply. SUPPLY.—Mountain springs, by gravity. RESERVOIRS.

—Cap., 1,750,000 galls.; three (press rept.). MANAGEMENT.—Prest., C. H. Hamson. Rept. by citizen, Nov. 11, '96.

103. **SELMA,** Fresno Co. (1,150.) Two private plants were damaged by fire June 30, '89, and bought by Selma Water Co., Jan. 1, '90. Apparently enlarged or rebuilt works in '90. SUPPLY.—Two artesian wells, 180 and 220 ft. deep, pumping to tank and direct. PUMPS.—700,000 galls.; Hooker and Dow. TANK.—Cap., 55,000 galls., on 60-ft. tower. DISTRIBUTION.—Mains, 5 miles. Hydrants, public, 16. PRESSURE.—Fire, 250 lbs. FINANCIAL.—Cost, $20,000. MANAGEMENT.—Prest., E. Dudley; Secy., Saml. Lewald; Supt., W. A. Clifford.

P 17. **SONOMA,** Sonoma Co. (757.) Press repts. state city works are projected and that Von Geldern & Grunsky, of San Francisco, has recommended pumping plant. Est. cost, $25,000. Mar. 18, '97, L. L. Lewis rept. he proposed to build gravity works, with 12 miles mains, and that people were to vote on same.

104. **SONORA,** Tuolumne Co. (1,441.) Built in '58 by Gold Mount Water Co. SUPPLY.—Springs, by gravity to reservoir, thence repumped to another reservoir. PUMP.—8 × 20-in. double-acting water power. RESERVOIRS.—Cap., 270,000 galls.; 150,000 and 120,000. DISTRIBUTION.—Mains, 5 miles. Taps, 267. Hydrants, 34. PRESSURE.—150-ft. head. FINANCIAL.—Cost, $40,000. Floating debt, $10,000, at 6%. Expenses, $2,930: Operating, $2,100; int., $600; taxes, $230. Revenue, $4,926: Consumers, unmetered, $4,554; City, fire protection, $200; other purposes, $172. NOTE.—No rept. since '90-1 Manual.

67. **SOUTH PASADENA,** Los Angeles Co. (623.) Supply from Pasadena Land & Water Co., Pasadena.

105. **STOCKTON,** San Joaquin Co. (14,424.) Built in '57 by P. E. Conner; afterwards owned by Stockton Water-Works Co.; purchased in '90, and rebuilt and enlarged in '91, by Stockton Water Co. FRANCHISE.—20 yrs. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Artesian wells, by pumping. PUMPS.—Cap., 5,000,000 (?) galls.; Holly-Gaskill hor. high duty. Rept. mention only this pump; in '89 there was a 3,000,000 Worthington comp. non-cond. and a 1,500,000 Risdon. Petroleum used as fuel. DISTRIBUTION.—Mains, 20 miles. Meters, 0. Hydrants, public, 104; private, 4. FINANCIAL.—(In '90.) Cap. Stock: Authorized, $500,000; paid-up, $250,000. No debt. MANAGEMENT.—Prest., R. McF. Doble; Secy., J. Sellenthall, both of San Francisco; Treas., Stockton Savings Bank; Ch. Pump. Engr., Geo. C. Turner. Rept. by Supt., M. S. Thresher, July 20, '96. PROJECTED IMPROVEMENTS.—Jan., '97, Supt. rept. steel tanks on steel trestles were talked of. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, June 2, '88.

D 13, P 18. **SUISUN CITY,** Solano Co. (499.) Built in '66 by Suisun & Fairfield Water Co. Franchise, 50 yrs. from '66. No legal difficulties. Supply, wells, pumping to two tanks. Pumps, cap., 30,000 galls., driven by wind and steam. Fiscal year closed June 30, '95. Mains, 2 miles. Taps, 184; made by Co. at cost. Services, lead; paid for by property owner. Meters, 0. Co can compel use of meters and any consumer may have one. Hydrants, 0. Consumption (galls.), av., 30,000. Expenses, Operating, $2,240. Prest., R. D. Robbins; Secy., G. A. Lamont. Rept. by Town Clk., O. B. Powers, June 12, '96. Has sanitary sewers only.

PROPOSED MUNICIPAL WORKS.

City voted $42,000 for works in '96 and let contract to San Francisco Bridge Co. Jan., '97, press rept. stated bonds had been sold and construction would be started.

—? **SUMMERLAND,** Santa Barbara Co. (Not given.) Citizen rept. in '96 that works were in operation. Address City Clk.

—? **SUMNER** (P. O. Kern), Kern Co. (Est., 622.) Built in '96 by Sumner Water Co. (press rept.). PUMP.—Cap., 1,000,000 galls.; Worthington comp. non-cond. (rept. by makers).

—. **TEMPLETON,** San Luis Obispo Co. (308.) Works are not now in operation. Built in '87 by Templeton Water Co.; now owned by Southern Pacific Milling Co. and West Coast Land Co. SUPPLY.—Infiltration well, near Salinas River, pumping to tank. PUMP.—Cap., 40,000 galls.; Dow. Wood used. TANK.—Cap., 40,000 galls.; on 60-ft. tower. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by Co. Services, galv. 1. Meters, 0. Hydrants, public, 4. MANAGEMENT.—Prest., R. M. Shackelford, Paso de Robles. Rept. by Secy., C. W. Steinbeck, June 9, '96. SEWERS.—None.

106. **THERMALITO,** Butte Co. (Not given.) Built in '87-8 by Thermalito Colony Co. SUPPLY.—West Branch of Feather River, by gravity to reservoirs. RESERVOIRS.—Cap., 20,000,000 galls. DISTRIBUTION.—Mains, 13.5 miles. Taps, 416. Hydrants, 40. PRESSURE.—(In '89.) 160 ft. head. FINANCIAL.—Cost, $250,000. Cap. Stock authorized, $1,000,000. Bonded debt, $75,000 at 7%. Expenses, $8,250: Operating, $3,000; int., $5,250. NOTE.—No rept. since '90-1 Manual.

107. **TRUCKEE,** Nevada Co. (Est., 1,350.) Now owned by Geo. Schaffer. Built in '68. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 337,500 galls. DISTRIBUTION.—Mains, 1 mile. Hydrants, 15. FINANCIAL.—Cost, $4,000. No debt. Expenses, $600. Revenue, $2,000. NOTE.—No rept. since '90-1 Manual.

108. **TULARE**, Tulare Co. (2,697.) Built in '82 by Tulare City Water Co. SUPPLY.—Artesian wells, pumping to tank and direct. PUMPS.—Cap., 2,300,000 galls.; 2—75,000 Hooker and one Buffalo. TANK.—Cap., 100,000 galls.; of wood. DISTRIBUTION.—Mains, 13 miles. Taps, 400. Hydrants, 40. PRESSURE.—(In '89.) Ordinary, 37 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $75,000. Cap. Stock authorized, $100,000; paid-up, $75,000; paid 6% div'd in '90. No debt. Expenses, $5,300: Operating, $5,000; taxes, $300. Revenue, $11,800: Consumers, $10,000; fire protection, $1,800. NOTE.—No rept. since '90-1 Manual.

109. **UKIAH**, Mendocino Co. (1,627.) First supplied prior to '91 by Ukiah Water Co. In '93, J. H. Brush, under name of Ukiah Water & Improvement Co., built works, and in '96 bought out old Co. (press rept. states for $8,000.). SUPPLY.—Russian River, pumping to reservoir 100 ft. above town. MANAGEMENT.—Owner, J. H. Brush. Rept. by Cy. Clk., W. E. Deering, Sept. 23, '96.

110. **VACAVILLE**, Solano Co. (725.) Built in '90 by Vacaville Water & Light Co.; put in operation in June. SUPPLY.—Wells, pumping to reservoir through distributing mains. PUMP.—Cap., 200,000 galls.; Worthington, dup. Wyoming coal used; av. cost, $7.45 per short ton delivered. RESERVOIR.—Cap., 110,000 galls. FISCAL YEAR CLOSED July 1, '96. DISTRIBUTION.—Mains, 1½ miles; cost extensions met by Co. Taps, 130; made by Co. for $5. Services paid for by consumer. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 24. CONSUMPTION.—(Galls.) av., 80,000; max., 150,000; min., 50,000. PRESSURE.—Ordinary and fire, 50 lbs. FINANCIAL.—Cost, $12,000. Cap. Stock: Authorized, $25,000; paid-up, $7,500; paid no div'd in '96. Floating debt, $4,500 at 7½%. Expenses, $2,235: Operating, $1,800; int., $360; taxes, $75. Revenue, $2,880: Consumers, $2,160; City, fire protection, $720. MANAGEMENT.—Prest., Frank H. Buck. Rept. by Secy., Treas. and Mgr., C. Fotheringham, Jan. 16, '97. SEWERS.—Has storm sewers only.

111, 112. **VALLEJO**, Solano Co. (6,343.)

VALLEJO WATER CO.

Built in '69-70 by Vallejo Water Co. SUPPLY.—Artificial lake, by gravity, and by pumping from supply mains to reservoir and w. t. stand-pipe. PUMPS.—Cap., 1,500,000 (?) galls.; 2—250,000 Hooker rept. in '89; maker's rept. 1,000,000 Worthington comp. non-cond. in '96. RESERVOIRS.—Impounding, area 160 acres, 3 miles from city; distributing, cap. 500,000 galls.; 150 ft. above tide. DISTRIBUTION.—Mains, 26 miles. Taps, 1,054. Meters, 40. Hydrants, 50. PRESSURE.—(In '89.) 0 to 75 lbs. FINANCIAL.—Cost, $293,857. Cap. Stock, $1,000,000: Bonded, $185,000 at 5%. Expenses, $34,757: Operating, $15,828; int., $9,250; taxes, $727. Revenue, $30,123: Consumers, $28,829; fire protection, none; other purposes, $1,294. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Feb. 25, '82.

CITY WORKS.

Built in '93 by city. SUPPLY.—Impounding reservoir in Wild Horse Valley, by gravity to distributing reservoir. First reservoir is about 15 miles from city. Water flows from it through stream bed about one mile, to diverting dam, from which conduit leads to distributing reservoir. Stream falls 700 ft. in the mile between dams, one waterfall being 70 ft. high. RESERVOIRS.—Cap., 404,000,000 galls.: Impounding, 400,000,000; Distriributing, 4,000,000; on Fleming Hill, 80 ft. above highest point in city, but direct pressure from supply main can be had. FISCAL YEAR CLOSED March 10, '95. DISTRIBUTION.—Taps, made by city at consumer's expense. PRESSURE.—Ordinary, 90 lbs.; fire, 225 lbs.; from diverting dam at Green Valley. FINANCIAL.—Cost, $276,000. Expenses (6 mos.), $10,080. Revenue (6 mos.), $12,736. MANAGEMENT.—Comrs. Chn., J. A. Browne; City Treas., J. R. English. Rept. by Clk. Water Dept., Jno. Cunningham.

D 14. **VALLEY SPRINGS**, Calaveras Co. (Est., 298.) Built in '84-5 by Thos. Hague for domestic use. Supply, South Fork of Mokelumne River, by gravity. Rept. by H. A. Mensinger, Aug. 14, '96.

113. **VENTURA**,, Ventura Co. (2,320.) Built in '72 by Santa Ana Water Co. FRANCHISE.—50 yrs. from '73. Co. is not exempt from local taxes. City to pay $600 per yr. for public service. No legal difficulties. SUPPLY.—San Buena Ventura River, 95% by gravity, 5% by pumping to higher part of town. PUMP.—Cap., 100,000 galls.; Worthington. Crude oil used for fuel. RESERVOIRS.—Cap., 3,000,000 galls.; three distributing, five miles from town. DISTRIBUTION.—Mains, 20 miles; cost extensions met by bonds. Taps, 600; made by Co. for $5. Services, iron; pand for by property owner. Meters, 20; owned, controlled and repaired by Co. Use of meters optional with Co. Hydrants, public, 25; private, 3. CONSUMPTION.—(Galls.) av., 1,500,000. PRESSURE.—Ordinary, 70 lbs.; fire, 35 to 60 lbs. FINANCIAL.—Cost, $167,452. Cap. Stock: Authorized, $100,000; paid-up, $167,452; paid $4,500 div'd in '96. Floating debt, $40,000 at 6%. Expenses, int., $2,461. MANAGEMENT.—Prest. and Supt., G. W. Chrisman; Secy. and Treas., E. P. Foster. Rept. by Supt., Jan. 25, '97. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, March 22, '84.

114. **VISALIA**, Tulare Co. (2,885.) First supplied in '77 by W. H. Hammond. In '90 works were owned by A. Crowley. Press repts. state: Visalia City Water Co. was

organized in '94 by owners and soon after improved works; that Jan. 31, '96, Co. having been declared insolvent and receiver appointed, sheriff sold works to Geo. Hanna; that in Mar., '96, another receiver was appointed. SUPPLY.—Artesian wells, pumping to tanks and direct. PUMPS.—Cap., 840,000 galls.; 360,000 Blake and 2—240,000 Hooker. TANKS.—Cap., 88,000 galls.: 28,000 and 10,000. DISTRIBUTION.—(In '87.) Mains, 5 miles. Hydrants, 12. FINANCIAL.—(In '87.) Cost, $30,000. Debt, $10,000 at 7%. Expenses, $3,820: Operating, $3,120; int., $700. Revenue, $6,720: Consumers, $6,270; City, $450. NOTE.—No rept. since '90-1 Manual. Mar., '96, press rept. stated Harry Levinson was receiver.

P 19. **WASHINGTON** (P. O., Sacramento), Yolo Co. (Township, 1,247.) Washington Water & Light Co. was incorp. Feb. 1, '97. Cap. Stock: Authorized, $6,000; paid-up, $5,800. Incorporators: H. Frommelt; J. Shaw and others.

115. **WATSONVILLE**, Santa Cruz Co. (2,149.) Built in '76-8 by Watsonville Water Co.; afterwards sold to Corralitos Water Co. See note. SUPPLY.—Corralitos Creek, by gravity to reservoirs. RESERVOIRS.—Cap., 2,800,000 galls.; 2,000,000 and 800,000. DISTRIBUTION.—Mains, 10 miles. Taps, 600. Hydrants, 80. PRESSURE.—(In '89.) 35 lbs. FINANCIAL.—Cost, $130,000. No debt. Expenses, $2,900: Operating, $2,000; taxes, $900. Revenue, $11,600: Consumers, $7,500; fire protection, $600; irrigation, $3,500. NOTE.—No rept. since '90-1 Manual. Dec. 5, '96, Watsonville Water & Light Co. was incorp. with authorized cap. stock of $500,000, by Francis Smith (Prest. of old Co. in '90), of Santa Clara; W. W. Montague, San Francisco, and others. REFERENCE.—Eng. News, Mar. 10, '83.

13. **WEST BERKELEY**, Alameda Co. (Est., 1,278.) See Berkeley.

117. **WHEATLAND**, Yuba Co. (630.) Built in '89-90 by Wheatland Water Co. FRANCHISE.—50 yrs. from '89. Co. is not exempt from local taxes and receives no compensation for public service. No legal difficulties. SUPPLY.—Wells, pumping to tanks and direct. PUMP.—Cap., 150,000 galls.; Blake. Wood used; av. cost, $4 per cord. TANKS.—Cap., 60,000 galls. galv. iron. FISCAL YEAR CLOSED Feb. 1. DISTRIBUTION.—Mains, 3 miles; cost extensions met by income. Taps, 115; made by Co. for $8, fee. Services, w. t.; paid for by property owner. Meters: 15; owned, controlled and repaired by Co. Use of meters optional with Co.; compulsory for wasteful consumers. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 125,000; max., 200,000; min., 50,000. PRESSURE.—Ordinary, 25 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $9,500. Cap. Stock: Authorized, $10,000; paid-up, $8,400; paid 6% div'd in '95. No debt. Expenses, $1,325: Operating, $1,250; taxes, $75. Revenue, $2,000: Consumers, unmetered, $1,500; metered $300; street sprinkling, $200. MANAGEMENT.—Prest. and Ch. Pump. Engr., J. Stineman; Treas., T. H. Thomas. Rept. by Secy. and Supt., H. C. Niemeyer, July 7, '96. SEWERS.—Has partial combined sanitary and storm sewers.

D 15, D 16. **WHITTIER**, Los Angeles Co. (585.)

EAST WHITTIER LAND & WATER CO.

Built in '92, principally for irrigation, but also supplies water for domestic use to section known as East Whittier. Supply, 14 artesian wells, lifted by 1,500,000-gall. pump, to 800,000 reservoir for domestic use. In '93 there were about 4 miles mains, 18 taps and 16 meters; ordinary pressure, 55 lbs. Repts. by A. L. Reed, Engr. and Mgr., Mar., '93, and Dec., '96.

PICKERING LAND & WATER CO.

Supplies water for irrigating and domestic use in Whittier proper. Makers rept. 750,000 Worthington comp. non-cond. pumps at Whittier, but do not state ownership.

D 17. **WILDOMAR**, Riverside Co. (Not given.) Works for domestic supply are owned by Wm. Collier.

118. **WILLOWS** (P. O., Sausalito), Marin Co. (Not given.) Built by Co. Makers rept. 1,000,000-gall. Worthington pump.

119. **WILMINGTON AND SAN PEDRO**, Los Angeles Co. (Wilmington, 687; San Pedro, 1,240.) Built in '82 by Wilmington Development Co. SUPPLY.—Wells, pumping to tanks and direct. PUMPS.—Cap., 1,000,000 galls; one Blake; 750,000 Dow comp. dup. TANKS.—Cap., 150,000 galls.; 3—50,000. DISTRIBUTION.—Mains, 12 miles. Hydrants, 12. PRESSURE.—50 to 120 lbs. FINANCIAL.—Cost, $50,000. No debt. NOTE.—No rept. since '90-1 Manual.

120. **WOODLAND**, Yolo Co. (3,069.) In '92 city bought out Woodland Water Co. (press rept. states for $25,000); first supplied in '73 by Co.; in '85 Woodland Water Co. built works. SUPPLY.—Artesian wells, pumping to tank and direct. PUMPS.—Cap., 2,250,000 (?) galls.: one Hooker and one Thompson & Evans, aggregating 1,000,000, rept. in '89; makers rept. 1,250,000 Worthington comp. non-cond. in '96. TANKS.—Cap., 100,000 galls.; four. DISTRIBUTION.—Mains, 8.5 miles. Taps, 900. Meters, 8. Hydrants, 28. FINANCIAL.—Cost, $53,000. Expenses, $7,426: Operating, $7,000; taxes, $426. NOTE.—No rept. since '90-1 Manual.

121. **YREKA**, Siskiyou Co. (1,100.) Built in '62 by H. Scheld. SUPPLY.—Springs, by gravity, and by pumping to reservoir during dry season. PUMPS.—Cap., 288,000 galls.; Worthington and No. 2½ Heald & Sisco centrifugal. TANK.—Cap., 60,000 galls.;

wood, 22 to 50 ft. above and ⅛ mile from town, with which it is connected by 6-in. pine logs. DISTRIBUTION.—Mains, 2 miles. Taps, 90. Hydrants, 12. FINANCIAL.—Cost, $3,600. SEWERS.—Partially sewered. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Apr. 1, '82.

122. **YUBA CITY**, Sutter Co. (562.) Built in '89 by Yuba City Water-Works Co. SUPPLY.—Artesian wells, pumping to tank. PUMPS.—Cap., 110,000 galls. TANK.—Cap., 65,000. DISTRIBUTION.—Mains, 2 miles. FINANCIAL.—Cost, $10,000. NOTE.—No rept. since '90-1 Manual.

ARIZONA.

P 1. **FLAGSTAFF**, Coconino Co. (963.) Congressional authority to issue $65,000 bonds for works was secured early in '97 and press rept. states that in Feb. people voted to issue the bonds. Gravity supply, with about 16 miles mains. Cy. Clk., F. W. Smith.

—? **NOGALES**, Pima Co. (1,194.) Sept., '94, Town Clk. rept. place was supplied by Co. under franchise. Supply, by pumping. Mgr. (in '94), H. K. Chenowith.

1. **PHOENIX**, Maricopa Co. (3,152.) Bought by Phoenix Water Co. in '90; domestic supply introduced '81 by J. J. Gardiner; complete works built in '87-8, by Gardiner & Son, and turned over to Phoenix Water-Works Co. in '89. FRANCHISE.—25 yrs. from '89; provides for purchase of works by city in 25 yrs., price to be settled by arbitration. Max. rates are fixed in franchise. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—Well, pumping to stand-pipe. PUMP.—Cap., 2,500,000 galls.; Deane. Wood used. STAND-PIPE.—Cap., 115,000 galls.; 14 × 100 ft. FISCAL YEAR CLOSED June 10. DISTRIBUTION.—Mains, 16 miles; cost extensions met by revenue. Taps made by Co. for $12. Services, iron; paid for by consumer. Meters: 40; owned and controlled by Co.; yearly rental, none. Use of meters optional with consumer. Hydrants, public, 50; private, 5. CONSUMPTION.—(Galls.) av., 800,000; max., 1,000,000; min., 350,000. PRESSURE.—Ordinary, 40 lbs.; fire, 60 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock: Authorized, $1,000,000; all paid-up. Bonded debt, $250,000 at 6%; due in 15 yrs. Sinking Fund, none. Expenses, $24,400: Operating, $8,400; int., $15,000; taxes, $1,000. MANAGEMENT.—Prest., C. F. Ainsworth; Secy., B. N. Pratt. Rept. by Supt., T. W. Hine, June 10. '96. SEWERS.—Has partial sanitary sewers only.

2. **PRESCOTT**, Yavapai Co. (1,759.) Built in '84 by town. SUPPLY.—Wells, pumping to distributing reservoir. PUMP.—Cap., 1,000,000 galls.; Blake comp. dup. Pine wood used; av. cost, $2.95 per cord. RESERVOIR.—Cap., 600,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 200; made by city for $7.50. Services, w. i.; paid for by consumer. Meters: 200; owned by consumer; controlled and repaired by city. Use of meters compulsory for all consumers. Hydrants, public, 32. CONSUMPTION.—(Galls.) av., 75,000. PRESSURE.—Ordinary, 100 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $100,000. Bonded debt, $60,000 at 5%. Expenses, Operating, $2,500. Revenue, Consumers, $8,000. MANAGEMENT.—Mayor, M. Goldwater; Secy., R. M. Luy. Rept. by Supt., J. F. Mahoney, July 12, '96. SEWERS.—None.

3. **TOMBSTONE**, Cochise Co. (1,875.) Owned by Huachuca Water Co. Built in '81-2 by Sycamore Springs Water Co. FRANCHISE.—50 yrs. from '81; does not provide for purchase of works by city. Rates "limited to 1 ct. per gallon." Co. is not exempt from local taxes and receives no compensation for public service. LEGAL DIFFICULTIES.—Suit by city for license tax won by Co. SUPPLY.—Collecting reservoir at head of Miller's Canyon by gravity to distributing reservoir. RESERVOIRS.—Collecting: 100 × 80 ft. by 22 ft. deep, 1,000 ft. above city. Distributing: 1,200,000 galls.; 360 ft. above Main St. DISTRIBUTION.—Mains (in '88), 25 miles. Hydrants (in '91), 213. FINANCIAL.—Cost, (in '88) $500,000. NOTE.—Above from '90-1 Manual, Co. declining to give further information. REFERENCE.—Eng. News, Aug. 12, '82.

4, P 2. **TUCSON**, Pima Co. (5,150.) Built in '81 by Tucson Water Co. FRANCHISE.—25 yrs.; provides for purchase of works by city in 1906. Rates are not fixed in franchise nor subject to regulation of city. SUPPLY.—Santa Cruz River, by gravity. Press rept. in '93 stated that supply had been supplemented by pumping from driven well to tank. DISTRIBUTION.—Mains (in '87), 6 miles. Taps (in '87), 500. Meters (in '87), 500. Hydrants (in '94), 56. FINANCIAL.—Cost (in '87), $80,000. Revenue, City (in '91), $8,400. NOTE.—No official rept. since '90-1 Manual.

PROPOSED MUNICIPAL WORKS.

Bill was before Congress in '96 authorizing city to issue $100,000 bonds for works. Rept. by Cy. Engr., L. D. Chillson, Mar., '96.

5. **YUMA**, Yuma Co. (1,773.) Built in '92 by Yuma Water & Light Co. SUPPLY.—Colorado River, pumping to reservoir. MANAGEMENT.—Mgr., H. W. Blanchard.

NEVADA.

1. **AUSTIN**, Lander Co. (1,215.) Built in '65 by Austin City Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchaise nor subject to regulation by city. SUPPLY.—Tunnel driven into mountain, by gravity from reservoir. RESERVOIR.—Cap., 50,000 galls.; 500 ft. above city. DISTRIBUTION.—Mains, 4.5 miles. Taps, 250. Hydrants, 17. FINANCIAL.—Cost, $20,000. No debt. Expenses, $1,582. MANAGEMENT.—Secy., R. W. Heath, 318 Pine St., San Francisco, Cal. NOTE.—No rept. since '90-1 Manual, except as to management. REFERENCE.—Eng. News, Oct. 14, '82.

D 1. **CANDELARIA**, Esmeralda Co. (345.) Built in '82 by Candelaria Water-Works & Milling Co. Supply, springs on White Mountain, by gravity. Reservoir, 500,000 galls. Water is brought 25 miles in a 4-in. iron pipe and sold to families at $4 per month; also to mines at from $100 to $250 a month. No rept. since '90-1 Manual.

2. **CARSON CITY**, Ormsby Co. (3,950.) Built in '75 by Carson Water Co. FRANCHISE.—50 yrs.; does not provide for purchase of works by city. Rates not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, by gravity to reservoir. RESERVOIR.—Cap., 3,000,000 galls. DISTRIBUTION.—Mains, 5 miles. Taps, 1,000. Services, iron. Hydrants, 26. FINANCIAL.—Cost, $100,000. Cap. Stock, authorized, $100,000; all paid-up. Floating debt, $8,000 at 8½%. NOTE.—No rept. since '90-1 Manual.

3. **ELKO**, Elko Co. (Est., 760.) First suplied in '74 by Hi Lay Water Co. In '90, Elko Water Co. began to operate works. SUPPLY.—Humboldt River, by gravity. RESERVOIR.—Cap., 4,600 galls. DISTRIBUTION.—Mains, 9,000 ft. Taps, 90. Hydrants, 4. PRESSURE.—(In '89.) 75 ft. head. FINANCIAL.—Cost, $20,000. NOTE.—No rept. since '90-1 Manual.

4. **EUREKA**, Eureka Co. (1,609.) Owned by Mrs. May J. McCoy; built in '71 by W. W. McCoy. FRANCHISE.—Perpetual. Rates are not subject to regulation by city. Owner is exempt from local taxes to extent of $4,000, "widow's exemption". City to pay $1,200 per yr. for public service. No legal difficulties. SUPPLY.—Springs, by gravity, and pumping. PUMPS.—Park & Lacy, 200,000 galls. Wood used as fuel. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 36 miles. Services paid for by property owners. Meters, 0. Use of meters optional with consumer at his own expense. Hydrants, public, 19; private, 4. CONSUMPTION.—(Galls.) av., 28,800. PRESSURE.—Ordinary, 45 to 90 lbs.; fire, 180 lbs. FINANCIAL.—Cost, $100,000. Expenses, Operating, $5,000; taxes, $420. Revenue, City, fire protection, $1,200. MANAGEMENT.—A. L. Fitzgerald, legal adviser; Supt., E. A. McConnell. Rept. by Secy., Edith S. Wick, July 22, '96. REFERENCE.—Eng. News, Mar. 11, '82.

—? **HAMILTON**, White Pine Co. (Est., 284.) Built in '69 by Eberhardt Mining Co. In '90 it was reported that system is no longer in operation. REFERENCE.—Eng. News, June 17, '82.

5. **PIOCHE**, Lincoln Co. (676.) Purchased in '89 by individuals; built in '72 by Pioche Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Springs, by gravity to tanks. TANKS.—Cap., 200,000 galls.; two of wood, one 300 ft., other 200 ft. above town. DISTRIBUTION.—Mains, 12 miles. Taps, 200. Services, w. i. Meters, 0. Hydrants, 30. PRESSURE.—300 ft. head. FINANCIAL.—(In '87.) Cost, about $151,400. No debt. Expenses, $3,362: Operating, $2,950; taxes, $412. Revenue, Consumers, $7,500. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Mar. 25, '82.

6, P 1. **RENO**, Washoe Co. (Est., 4,123.) Now owned by Reno Water, Land & Light Co., formerly known as Reno Gas & Water Co. Built in '78 by A. A. Evans. FRANCHISE.—Rates are not subject to regulation by city. Co. is not exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Truckee River, by gravity through ditch to reservoir. RESERVOIRS.—Cap., 30,000,000 galls.; three storage and one distributing. FISCAL YEAR CLOSED Apr. 30. DISTRIBUTION.—Taps, 450; made by Co. for $2 to $10. Hydrants, public, 17. CONSUMPTION.—(Galls.), max., 2,000,000; min., 1,000,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cap. Stock, Authorized, $300,000. Bonded debt, $150,000, at 6%. Co. also owns gas and electric light plant. MANAGEMENT.—Prest., C. C. Powning; Vice-Prest., W. O. H. Martin; Secy., W. L. Bechtel; Supt., Geo. F. Bliss. Rept. by Prest., July 25, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, June 14, '84.

PROPOSED MUNICIPAL WORKS.

Nov. 3, '96, people voted, 800 to 200, in favor of owning water and gas plants. Rept. by R. L. Taylor. In Jan., '97, bill was introduced in state legislature to incorp. city, proposed act giving city authority to issue $100,000 bonds for water-works.

8. **SILVER CITY**, Lyon Co. (342.) Supply from Virginia City.

7. **TUSCARORA**, Elko Co. (1,156.) Built in '88 by Tuscarora Water Co. SUPPLY.—Twin Bridges Creek. DISTRIBUTION.—Mains, 15 miles. Taps, 250. Hydrants, 12.

FINANCIAL.—Withheld. NOTE.—No rept. since '90-1 Manual. Co.'s offices July, '96, were 310 Pine St., San Francisco, and J. W. Pew was then Secy.

8. **VIRGINIA CITY**, Storey Co. (8,511.) Built in '72 by Co. Supplies Silver City. SUPPLY.—Creeks and artificial lake, by gravity from impounding to distributing reservoir. Combined drainage area given as 34 sq. miles. CONDUIT.—Between reservoirs. For 22 miles it is a plank flume 16½ × 18 ins. Across Washoe Valley, water is conveyed in three w. i. pipes, one 12-in. riveted, one 11-in. and one 12-in. lap-welded; at lowest point, these pipes are 1,496 ft. below outlet. RESERVOIRS.—Impounding: Marlette Lake, area 800 acres. Distributing: Cap., 12,100,000 galls.; 8,300,000 and 3,800,000. DISTRIBUTION.—Mains, 23 miles. Taps, 1,980. Services, w. i. Hydrants, 108. PRESSURE.—(In '89.) Ordinary, 90 lbs.; fire, 130 lbs. FINANCIAL.—Cost, $4,428,390. Cap. Stock: Authorised, $5,000,000. No debt. Expenses, taxes, $4,792. SEWERS.—Has sewers. NOTE.—No report since '90-1 Manual. REFERENCE.—Eng. News, May 13, '82.

9. **WINNEMUCCA**, Humboldt Co. (1,037.) Built in '77 by Co. SUPPLY.—Cross canyon by gravity and pumping. PUMPS.—Cap., 500,000 galls.; Dow. RESERVOIRS.—Storage, cap., about 1,000,000; distributing, 125 ft. above town. DISTRIBUTION.—Mains, 10 miles. Taps, 150. Hydrants, public, 18. CONSUMPTION.—(Galls.) av., 700,000. PRESSURE.—(In '89.) 60 lbs. FINANCIAL.—Cost, $20,000. No debt. Expenses, $5,000. MANAGEMENT.—Prest. and Secy., Francis Smith. Rept. by Jos. Rougon, Supt., Sept. 21, '96. REFERENCE.—Eng. News, July 29, '82.

UTAH.

1. **BRIGHAM**, Boxelder Co. (2,139.) Built in '92 by city. Engr., David James, Salt Lake City. SUPPLY.—Springs, to and from distributing reservoirs, through 8-in. vitrified pipe. RESERVOIR.—Cap., 240,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4 miles. Taps, 125; made by city. Services, galv. i.; paid for by city to sidewalk. Hydrants, public, 31. PRESSURE.—Ordinary, 75 lbs. FINANCIAL.—Cost, $28,000. Debt, $27,500; Floating, $3,500, at 10%; Bonded, $24,000, at 6%; due 1912. Sinking Fund, none. Expenses, Operating, $449. Revenue, Consumers, $1,334. MANAGEMENT.—Rept. by Jonah Mathias, Aug. 31, '96. SEWERS.—None.

D 1. **ELSINORE**. Sevier Co. (Precinct, 590.) Built in '93 by Co. for domestic supply. Franchise, 50 yrs. from '93; does not provide for purchase of works, nor regulation of rates by city; Co. is exempt from local taxes. Supply, canal, by gravity. Taps, 45. Meters, 0. Cost, $500. No debt. Secy., H. C. Lassen. Treas., J. L. Jensen. Supt., S. C. Peterra. Rept. by Prest., P. Christensen, Oct. 19, '96.

2. **EUREKA**, Juab Co. (1,733.) Built in '90 by Howansville Water Co. SUPPLY.—Springs, pumping to tank. PUMP.—Cap., 120,000 galls.; Knowles. TANK.—Cap., 60,000 galls. DISTRIBUTION.—Mains, 5½ miles. Taps, 116. Hydrants, 6. PRESSURE.—Ordinary, 110 lbs. No debt. Expenses, $3,120. Revenue, Consumers, $4,875. NOTE.—No rept. since '90-1 Manual.

3. **FOREST DALE**, (P. O. Salt Lake City), Salt Lake Co. (Est., 300.) Built in '93-4 by Forest Dale Water Co.; put in operation Jan. 25. FRANCHISE.—25 yrs. from '93. Rates are not subject to regulation by city. Co. is exempt from local taxes so long as owned by the parties to whom water is furnished. No legal difficulties. SUPPLY.—Several large springs, concentrated to form two reservoirs, each having an area of about one acre, and an av. depth of 7 ft. DISTRIBUTION.—Mains, 3¼ miles; cost extensions met by bonds. Taps, 42; made by Co., including service to curb. Services, lead or galv. i.; paid for by owner of property. Meters, 0. Hydrants, public, 10. Overflow from reservoir is utilized by the Co. for irrigation. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $50,000; paid-up, $35,000. Bonded debt, $15,000, at 10%. Sinking Fund, none. Expenses: $1,570: Operating, $70; int., $1,500. Revenue: Consumers, $600. Deficits are met by assessments on capital stock. MANAGEMENT.—Secy. and Treas., M. C. Morris. Rept. by Prest. and Supt., Geo. M. Cannon, Sept. 3, '96. NOTE.—Forest Dale is a tract of land just outside of the corporate limits of Salt Lake City, and embraces the farm of Brigham Young; formerly called "Forest Farm".

4. **LOGAN**, Cache Co. (4,565.) Built in '79-80 by city. Improved in '93; Engr., Saml. Fortier; Contr., A. H. Palmer. SUPPLY.—Logan River, by gravity through canal to reservoir. RESERVOIR.—On high bench, 1½ miles east of city; not yet completed. FISCAL YEAR CLOSED Dec, 31, '95. DISTRIBUTION.—Mains, 4 miles; cost extensions met by special tax. Taps, 124; made by city, free. Services, lead to curb; paid for by city to curb. Use of meters optional with consumer. Hydrants, public, 15; private, 4. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 80 lbs.; fire, 135 lbs. FINANCIAL.—Cost, $48,652. Expenses, Operating, $800. Revenue, Consumers, $1,000. MANAGEMENT.—Rept. by Supt., A. H. Palmer, June 22, '96. SEWERS.—None. REFERENCE.—Eng. News, Mar. 4, '82.

5. **MANTI,** Sanpete Co. (1,950.) Built in '96 by city for general supply. SUPPLY.—Springs, by gravity. MANAGEMENT.—Address Richard Hall, Jr.

D 2. **MIDWAY,** Wasatch Co. (Precinct, 769.) Built in '96 by Co., for domestic supply, each householder using water subscribing to stock. Engr., John Watkins. Franchise, 50 yrs. from '95. Rates are $1 per month in advance to new shareholders. Co. is exempt from local taxes at present. City to pay 25 cts. per hour for services performed. Supply, springs, by gravity from 7 × 12 ft. brick tank, through 9,000 ft. of pipe, having fall of 175 ft. Taps, 140; made by town. Services, iron; paid for by Co. Pressure, ordinary, 86 lbs. Cost, $10,000. Cap. Stock, $7,000. Floating debt, $250 at 10%. Secy., A. Wootton; Treas., Geo. Bonner. Rept. by Prest., Jno. Watkins, Sept. 16, '96. SEWERS.—None.

6. **NEPHI,** Juab Co. (2,084.) Built in '89-90 by city. SUPPLY.—Springs, by gravity to and from distributing reservoir. RESERVOIR.—Cap., 50,000 galls. DISTRIBUTION.—Mains, 5.5 miles. Taps, 70. Hydrants, 12. FINANCIAL.—Cost, $15,000. Bonded debt, $12,000 at 7%; due in '99. Expenses, nominal. Revenue, consumers, $800. NOTE.—No rept. since '90-1 Manual.

7. **OGDEN,** Weber Co. (14,889.) Present works built in '89-90 by Bear Lake & River Water-Works & Irrigation Co.; now known as Bear River Irrigation & Ogden Water-Works Co. Old works built by city in '80-2 and sold to Co. in '90; same have been abandoned by co. FRANCHISE.—Provides for perpetual right of city to buy distributing system, price to be revenue capitalized at 5%. Rates are not fixed in franchise nor subject to regulation by city except that contract calls for three 10% reductions from old city rates in 6 yrs. City to pay hydrant rental at rate of $75 each, for first 100 hydrants, additional ones at $60 each. Perpetual lease of water owned by city. No legal difficulties. SUPPLY.—Ogden River, by gravity from impounding reservoir, about 10 miles from city, to distributing reservoir. RESERVOIR.—Cap., 6,775,000 galls.; distributing, 6,500,000; impounding, 275,000. Two Union pressure regulators are used, one 16-in. and one 12-in., reducing pressure from reservoir to city, from 180 to 110 lbs. FISCAL YEAR CLOSED Mar. 1. DISTRIBUTION.—Mains, 32 miles; cost extensions met by revenue. Taps, 1,800; made by Co. at $3.50 to $6 for ½ to 1-in. Services, galv. i.; paid for by consumer. Meters: 65; owned by Co. or consumer; controlled by Co.; repairs paid by owner. Co. cannot compel but may prohibit use of meters. Hydrants, public, 108. CONSUMPTION.—(Galls.) av., 4,000,000. PRESSURE.—Ordinary, 110 lbs.; fire, 130 lbs. Steam fire engines are not ordinarily used. FINANCIAL.—Revenue, City, fire protection, $6,500. MANAGEMENT.—Prest., W. H. Rowe; Secy., and Treas., S. L. Conklin, New York; Asst. Secy., P. M. Hanley. Rept. by Asst. Secy., P. M. Hanley, June 10, '96. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, July 7, '88; wooden pipes, Nov. 8, '94; Bear River irrigation system, Feb. 6, '96; old and new systems, May 21, '96, illus.

8. **PARK CITY,** Summit Co. (2,850.) Built in '80 by Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. SUPPLY.—Mountain stream, by gravity. RESERVOIRS.—Cap., 1,000,000 galls.; three, formed by small dams, lowest of which is 200 ft. above city. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5 miles. Taps, about, 800. Meters, 0. Hydrants, public, 28. FINANCIAL.—Cost, $45,000. Cap. Stock: Authorized, $20,000; all paid-up. Debt, $10,000. MANAGEMENT.—Prest., R. E. Chambers; Vice-Prest. and Treas., W. V. Rice. Rept. by Secy., Barton Wherritt, Sept. 25, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, July 29, '82.

9. **PROVO CITY,** Utah Co. (5,159.) Built in '91 by city; put in operation Dec. 1. Consult. Engr., C. P. Allen; Des. Engr., D. C. Henny; Contrs., Rhodes Bros., all of Denver, Colo. SUPPLY.—Provo River, by gravity from settling to distributing reservoir. RESERVOIRS.—Settling (in '92); cap., 130,000 galls.; two basins, with concrete bottoms and wooden roofs. Distributing: Cap., 4,400,000 galls.: 2—2,200,000. SUPPLY MAINS.—First 3½ miles, 14-in. redwood stave pipe, thence 12-in. c. i. Lower end of wood pipe is under 165-ft. head. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 17 miles; cost extensions met by consumers. Taps, 330; made by city at consumer's expense. Services, galv. i. and lead; paid for by consumer. Hydrants, public, 80, private, 6. CONSUMPTION.—(Galls.) av., 400,000 (est.). PRESSURE.—Ordinary, 75 lbs.; fire, 96 lbs. FINANCIAL.—Cost, $13,000. Bonded debt, $125,000, at 6%; due 1911. Expenses, Operating, $5,882, from '91 to Nov. 30, '95. Revenue, Consumers, $11,920. Deficits are met by taxation. MANAGEMENT.—Prest., L. Holbrook, Mayor; Secy., L. L. Nelson, Cy. Recr.; Treas., J. T. Farer. Rept. by Supt., J. E. Armitstead, June 15, '96. SEWERS.—None.

10. **SALT LAKE CITY,** Salt Lake Co. (44,843.) Built in '74 by city. SUPPLY.—Mountain streams, by gravity. Three independent sources are utilized, City Creek, Parley's Canyon and Emigration Creek. Parley's Canyon conduit is a 3-ft. masonry aqueduct, about 5½ miles long. RESERVOIRS.—Cap., 2,875,000 galls.; distributing: 85,000, 220,000, 70,000 and 2,500,000. FISCAL YEAR CLOSED June 30, '95. DISTRIBUTION.—Mains, 125 miles; cost extensions met by frontage tax at $1.15 per ft. for 6-in. main. Taps, 9,000; made by city, no fee. Services, lead; paid for by property owner. Meters: 2; owned and controlled by city. Use of meters optional with consumer. Hydrants,

public, 1,400. CONSUMPTION.—(Galls.) av., 15,000,000. PRESSURE.—Ordinary, 90 lbs.; fire, 120 lbs. FINANCIAL.—Cost, about, $1,000,000. Expenses, Operating, $22,612. Revenue, $90,000. MANAGEMENT.—Act. Supt., H. C. Wallace. Rept. by Act. Supt., June 12, '96. SEWERS.—Has sanitary sewers. REFERENCES.—Eng. News, Dec. 17, '81; details of supply system, Oct. 22, '96, illus. and inset.

11. **TOOELE**, Tooele Co. (Est., 1,000.) Built in '90 by Tooele City Water Co., city owning about one-third of stock. Engr., Francis M. Lyman, Jr.; Constr., David James, both of Salt Lake City. FRANCHISE.—25 yrs. from '90. Max. rates are fixed in franchise. Co. is not exempt from local taxes. City to pay $800 per yr. for fire protection. SUPPLY.—Beautiful Spring, by gravity. RESERVOIR.—Cap., 80,000 galls.; distributing. FISCAL YEAR CLOSED Aug. 31, '95. DISTRIBUTION.—Mains, 5 miles; cost extensions met by assessments on stock. Taps, 121; made by Co. Services, ½ and ¾-in. galv. i.; paid for by Co. to curb. Meters, 0. Co. can compel use of meters and any consumer may have one. Hydrants, public, 5. CONSUMPTION.—(Galls.) av., 25,000; max, 73,000. PRESSURE.—Ordinary and fire, 80 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $25,000; paid-up, $20,000; paid 3% div'd in '95. No debt. Expenses: Operating and taxes, $425. Revenue, $1,322: City, fire protection, $300; other purposes, $1,022. Deficits are met by assessments on stock. MANAGEMENT.—Prest., Francis M. Lyman; Treas., Geo. F. Richards. Rept. by Secy. and Supt., Hugh S. Gowant, Jan. 14, '97. SEWERS.—None.

IDAHO.

1. **BELLEVUE**, Blaine Co. (892.) Built in '87 by Bellevue Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not subject to regulation by city. SUPPLY.—Seaman's Creek, by gravity from impounding reservoir. DISTRIBUTION.—Mains, 5 miles. Taps, 165. Hydrants, 8. PRESSURE.—(In '89.) 65 lbs. FINANCIAL.—Cost, $16,000. Cap. Stock: Authorized, $30,000; all paid-up; paid 10% div'd in '90. No debt. Expenses, $305: Operating, $790; taxes, $15. Revenue, $3,333: Consumers, $2,990; City, fire protection, $343. NOTE.—No rept. since '90-1 Manual.

2. **BOISE**, Ada Co. (2,811.) Built in '90 by two Cos., afterwards consolidated as Artesian Hot & Cold Water Co., Ltd. FRANCHISE.—50 yrs. from '91; does not provide for purchase of works by city. Rates are fixed by commission chosen by city and Co. Co. is not exempt from local taxes. City to pay usual rates for public service, except for fire protection, which is free. LEGAL DIFFICULTIES.—City attempted to compel Co. to furnish better pressure for fire purposes; decided for Co. SUPPLY.—Eight 6-in. artesian wells, 150 to 600 ft. deep, and open well, pumping to reservoirs and direct. There is also a complete system running through the principal streets for furnishing hot water (170° F.), for heating and domestic purposes and Co. also owns and operates a bathing resort near their hot wells. PUMPS.—Cap., 1,500,000 galls.; Worthington comp. dup. Sawdust is used for fuel. RESERVOIRS.—Cap., 1,295,000 galls.; 550,000, 220,000 and 525,000. FISCAL YEAR CLOSED Feb. 29. DISTRIBUTION.—Mains, 20 miles; cost extensions met by earnings thus far. Taps, 780; made by Co. for $5, including service to curb. Services, iron; paid for by consumer. Meters: 26; owned, controlled and repaired by Co.; yearly rental, none. Use of meters optional with Co.; compulsory for livery stables, laundries and all large consumers. Hydrants, public, 55. CONSUMPTION.—(Galls.), av., 500,000. PRESSURE.—Ordinary, 35 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Cost, $180,308. Cap. Stock: Authorized, $250,000; paid-up, $187,700. No div'd. Bonded debt, $85,000, at 8%, due in '97. Sinking Fund, none. Expenses, $12,971: Operating, $4,970; int., $6,122; taxes and insurance, $1,879. Revenue, $17,817. MANAGEMENT.—Prest., C. W. Moore; Treas., Alfred Eoff; Supt., H. B. Eastman. Rept. by Secy., B. S. Howe, June 9, '96. SEWERS.—Has sanitary sewers only.

3. **COEUR D'ALENE**, Kootenai Co. (491.) Built in '90 by D. C. Corbin, C. A. De Saussun, King & Monaghan. FRANCHISE.—50 yrs. from '90. Rates are not subject to regulation by city. Co. is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Lake Coeur d'Alene. PUMP.—Cap., 13,500 galls.; Worthington. Wood used; av. cost, $1.75 to $2.00 per cord. TANK.—Cap., 40,000 galls.; wood. DISTRIBUTION.—Mains, 2¼ miles. Taps, 100; made by water-works, including service to curb for $8 to $10. Services, galv. i.; paid for by consumer. Meters: 1; owned by Co. Hydrants, public, 15. CONSUMPTION.—(Galls.) av., 40,000, in winter; max., 100,000, in summer. PRESSURE.—Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $19,500. No debt. MANAGEMENT.—Ch. Pump. Engr., H. M. Thamke. Rept. by Secy. and Supt., C. A. De Saussun, June 15, '96. SEWERS.—None.

P 1. **GENESEE**, Latah Co. (282.) Works rept. as projected.

4. **HAILEY**, Blaine Co. (Precinct, 1,078.) Built in '84, by Alturas Water Co. FRANCHISE.—Does not provide for purchase of works by city. Rates are not fixed in

franchise nor subject to regulation by city. SUPPLY.—Indian Creek, by gravity. RESERVOIR.—(In '89.) Cap., 250,000 galls.; 110 ft. above town. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 5 miles. Taps, 150. Meters, 0. Hydrants, public, 7. PRESSURE.—(In '89.) 36 lbs. FINANCIAL.—Cost, $15,000; paid 9% div'd in '95. No debt. Expenses, $1,050: Operating, $800; taxes, $250. MANAGEMENT.—Prest., Texas Angel; Secy., E. A. White; Rept. by Supt., W. T. Riley, Sept. 22, '96. REFERENCE.—Eng. News, Feb. 28, '85.

5. **IDAHO FALLS,** Bingham Co. (Precinct, 1,588.) Built in '85 by Eagle Rock Water-Works Co. FRANCHISE.—30 yrs. from '89; does not provide for purchase of works by city, but that Co. may make such rates as will give a net revenue of 15% on cost of construction, exclusive of operating expenses and repairs. Co. is not exempt from local taxes, and receives no compensation for public service. LEGAL DIFFICULTIES.—City granted an exclusive franchise and has since made two attempts to vote city bonds for competing plant. SUPPLY.—Snake River, pumping to tanks and direct. PUMP.—Cap., 240,000 galls.; Knowles, steam; windmill is also used. Rock Springs bituminous coal used; av. cost, $6.50 per short ton. TANKS.—Cap., 70,000 galls.; 2—35,000. FISCAL YEAR CLOSED May 1. DISTRIBUTION.—Mains: Cost extensions met by revenue. Taps, 124; made by Co. at cost. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 3; private, 2. CONSUMPTION.—(Galls.), av., 60,000; max., 100,000; min., 30,000. PRESSURE.—Ordinary, 12 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $12,000. Expenses, $2,300: Operating, $2,500; taxes, $100. Revenue: Consumers, $3,600; City, none. MANAGEMENT.—Prest., J. A. Clark; Treas., C. W. Ramsey; Ch. Pump. Engr., W. Hill. Rept. by Secy. and Supt., W. H. B. Crow, Sept. 24, '96. SEWERS.—None.

D 1, P 2. **KENDRICK,** Latah Co. (Not given.) Private works supply about a dozen families. July, '96, $11,000 village bonds were for sale, proceeds to be used for gravity supply from springs. Engr., W. R. Graham, Kendrick. Jan., '97, citizen rept. bonds could not be sold, owing to stringency of money market.

6. **KETCHUM,** Blaine Co. (450.) Built in '89 by Ketchum Spring Water Supply Co. FRANCHISE.—20 yrs. from '86; does not provide for purchase of works by city. Rates are not fixed in franchise nor subject to regulation by city. No compensation for public service. SUPPLY.—Springs, by gravity to and from reservoir. RESERVOIR.—Cap., 100,000 galls. DISTRIBUTION.—Mains, 3 miles; cost extensions met by Co. Taps, 100; made by consumer. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 8. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $14,000. Cap. Stock: Authorized, $24,000; paid-up, $12,000; paid 4% div'd in '96. No debt. Expenses, $469: Operating, $400; taxes, $69. Revenue: Consumers, $1,400; City, none. MANAGEMENT.—Prest., I. I. Lewis. Rept. by Secy. and Supt., Geo. J. Lewis, June 9, '96. SEWERS.—None.

7. **LEWISTON,** Nez Perces Co. (849.) Built in '90-1 by Lewiston Water & Light Co.; put in operation May 1, '91. FRANCHISE.—25 yrs. SUPPLY.—Clearwater River, pumping to reservoir and direct. PUMP.—Cap., 1,000,000 galls.; Knowles comp. dup. RESERVOIR. — Cap., 1,000,000 galls. DISTRIBUTION. — Mains, 8 miles. Taps, 200. Hydrants, public, 18. PRESSURE.—Ordinary, 97 lbs. FINANCIAL.—Cost, $80,000. Cap. Stock: Authorized, $100,000; paid-up, $30,000. Bonded debt, $50,000, at 6%. Expenses, $4,500. Revenue: City, fire protection, $2,490. MANAGEMENT.—Prest., J. B. Morris; Treas., C. C. Bunnell. Rept. by Secy., F. W. Rettenbach, Sept. 26, '96.

P 8. **MONTPELIER,** Bear Lake Co. (1,174.) Nov., '96, citizen rept. there was talk of building works.

8. **MOSCOW,** Latah Co. (Precinct, 2,861.) Built in '90 by town. SUPPLY.—Artesian well, pumping to stand-pipe. PUMPS.—Cap., 300,000 galls.; Evans (San Francisco). Wood used. STAND-PIPE.—Cap., 105,000 galls.; iron; 15 × 80 ft. DISTRIBUTION.—Mains; cost extensions met by bonds. Taps, made by city. Services, galv. i.; paid for by city to sidewalk. Meters, 3; owned, controlled and repaired by city. Use of meters compulsory for planing mill and Electric Light & Power Co. City can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 200,000; max., 300,000; min., 100,000. PRESSURE.—Ordinary and fire, 85 lbs. FINANCIAL.—Cost, $45,000. Expenses: Operating, $2,300; taxes, none. Revenue, $7,100: Consumers, $6,000; City, fire protection, $1,100. MANAGEMENT.—Mayor, F. E. Cornwall; Clerk, H. H. Robinson; Treas., Wm. Hunter. Rept. by Ch. Pump. Engr., W. H. Beardsley, Oct. 26, '96. SEWERS.—Has sanitary and storm sewers.

9. **MULLAN,** Shoshone Co. (Precinct, 818.) Built in '90 by A. M. Strode. SUPPLY.—Mill Creek, by gravity. Dec., '96, press rept. stated source had been changed to a spring, owing to contamination of creek by mine drainage. RESERVOIR.—Cap., 50,000 galls. DISTRIBUTION.—Mains, 6,000 ft. Taps, 200. Hydrants, 7. PRESSURE.—125 lbs. FINANCIAL.—Cost, $13,000. No debt. Expenses, $600. Revenue, $6,300: Consumers, $4,800; City, $1,500. NOTE.—No official rept. since '90-1 Manual.

10. **MURRAY,** Shoshone Co. (Precinct, 450.) Built in '86 by Co. FRANCHISE.—50 yrs. from '86. SUPPLY.—Three small mountain streams, conducted in 6-in. wooden pipe to tank. TANK.—Cap., 52,000 galls. FISCAL YEAR CLOSED Jan. 1, '97. DISTRIBUTION.—Taps, 75; made by Co. Services, paid for by consumer. Use of meters

optional with consumer. Hydrants, public, 4. FINANCIAL.—Cost, $8,000. Expenses: Operating, $360. Revenue: City, fire protection, $1,500. MANAGEMENT.—Secy., Rose Aulbach. Rept. by Prest. and Supt., Adam Aulbach, Jan. 16, '97. SEWERS.—None.

P 1. **OSBURN,** Shoshone Co. (Precinct, 259.) Built in '90 by W. B. Heyburn. No legal difficulties. Supply, mountain stream and springs, by gravity. Mains, 1½ miles; cost extensions met by consumer. Taps, 20; made by propery owner. Services, iron; paid for by property owner. Pressure, 240 ft. head. Cost, $2,500. No stock nor debt. Revenue, Consumers, $600. Rept. by owner, July 28, '96.

11. **POCATELLO,** Bannock Co. (Precinct, 2,330.) Now owned by Jas. A. Murray, under name Pocatello Water Co. First supplied in '82 by Union Pacific Ry. Co., which then owned the settlement. Ry. Co. still has quite extensive works, but they are now exclusively for its use. Dec., '90, Centre St. Water Co. put works in operation, buying water from Ry. Co. In '92 Jas. Murray built works, as above; put in operation Oct. 1. Engr., Geo. Winter. FRANCHISE.—50 yrs. from '90; does not provide for purchase of works by city. Rates fixed by two comrs. appointed by Mayor and two appointed by Co. City to pay $61.50 per hydrant per yr. No legal difficulties. SUPPLY.—Mountain streams, 10 miles from city, by gravity through wooden conduit to reservoirs. RESERVOIRS.—Cap., 4,000,000 galls.: Storage, 3,500,000, 562 ft. above city; distributing, 500,000, 262 ft. above city. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 8 miles; cost extensions met by Co. Taps, 450; made by Co. Services, galv. i.; paid for by property owner. Meters, 0. Any consumer may have a meter. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 250,000; max., 400,000; min., 150,000. PRESSURE.—Ordinary and fire, 113 lbs. FINANCIAL.—Cost, $130,000. Cap. Stock: Authorized, $100,000; paid 6% div'd in '96. No debt. Expenses, $2,980: Operating, $2,500; taxes, $480. Revenue, $12,092: Consumers, unmetered, $10,250; City, fire protection, $1,722; public buildings, $120. MANAGEMENT.—Prest., Jas. A. Murray, Butte, Mont. Rept. by Secy. and Supt., Geo. Winter, Jan. 12, '97. PROJECTED IMPROVEMENTS.—Wooden conduit to be replaced by iron pipe. Trench for pipe has been excavated. SEWERS.—None.

12. **RATHDRUM,** Kootenai Co. (218.) Built in '92 by Rathdrum Water & Power Co.; put in operation in Sept. Engr. and Contr., Rolla A. Jones, Spokane, Wash. FRANCHISE.—50 yrs. from '92. Co. is exempt from local taxes, but there is no compensation for public service. No legal difficulties. SUPPLY.—Mountain stream, by gravity from reservoir formed by 10-ft. dam across canyon. FISCAL YEAR CLOSED Apr. 8. DISTRIBUTION.—Mains, 2 miles; cost extensions met by Co. Taps, 75; made by Co., including service to curb for $2 per mo. Services, galv. i. Hydrants, public, 8. Abundant supply of water for 2,000 inhabitants. PRESSURE.—Ordinary, 64 lbs. FINANCIAL.—Cost, $7,000. Cap. Stock: Authorized, $7,000; all paid-up. No debt. Expenses: Taxes, $76. MANAGEMENT.—Prest., John Russell; Supt., Jos. Poirier. Rept. by Secy., Frank Wenz. SEWERS.—None.

P 4 **SALMON,** Lemhi Co. (Precinct, 916.) Contract was let for works in '96, pay to be in bonds, but Contr. would not dispose of bonds. Late in '96 talk of works was renewed. Engr., R. W. Faris, Idaho Falls. Supply, Jessie Creek, with fall of 150-ft. Est. cost, $15,000. Rept. by Chn. Bd. Trustees, J. W. Birdseye, Dec. 8, '96.

13. **WALLACE,** Shoshone Co. (878.) Built by Wallace Manufacturing, Electric & Water Co. Rept. by Cy. Clk., Jos. Le Grand, Aug., '96.

14. **WARDNER,** Shoshone Co. (Precinct 858.) Built in '86 by Alexander Monk. FRANCHISE.—Prop. is not exempt from local taxes, and receives no compensation for public service. SUPPLY.—Springs and brook, ½ mile from and 400 ft. above town, by gravity to tanks through flume about 1½ miles long. TANKS.—Cap., 75,000 galls.; 55,000 and 20,000, about 500 ft. above town. Flume also acts as storage reservoir. DISTRIBUTION.—Mains, 1¾ miles; cost extensions met by proprietor. Taps, 100; made by Supt. Services, paid for by prop. Meters, 0. Hydrants, public, 5; private, 3. CONSUMPTION.—(Galls.) av., 20,000. PRESSURE.—Ordinary, 60 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $25,000. Expenses: Taxes, $120. Revenue, City, none. MANAGEMENT.—Rept. by Supt., J. F. Van Allen, Aug. 26, '96. SEWERS.—None.

ALASKA.

P 1. **DOUGLAS,** (402.) Press rept. Jan. 15, '97, stated Douglas City Water-Works Co. and citizens were to hold a conference over proposition to furnish a water supply.

1. **JUNEAU,** (1,253.) Rept. of Governor of Alaska for '95-6 states that this place has water and electric light plant (apparently owned by Co.), but is without corporate existence, and must remain so, under existing laws.

GROUP IX.—CANADIAN MARITIME PROVINCES.

Water-Works Completed, in Process of Construction or Projected, in New Brunswick, Nova Scotia and Prince Edward Island.*

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

NEW BRUNSWICK.

1. **CAMPBELLTON,** Restigouche Co. (Est., 600.) Built in '94 by Campbellton Co.; put in operation in Dec. Engr., J. O. A. La Forest, Montreal. Contrs., Canada Pipe & Foundry Co., Montreal. FRANCHISE.—25 yrs. from '94. City to pay $50 and $55 per yr. per hydrant. SUPPLY.—Parkers Lake, 2½ miles from town, by gravity. RESERVOIR.—Cap., 1,200,000 galls. DISTRIBUTION.—Mains, 6 miles. Taps, 150. Meters, 2. Hydrants, public, 20. FINANCIAL.—Cost, $70,000. Expenses: Operating, $700. Revenue, $2,250: Consumers, $1,400; City, fire protection, $850. MANAGEMENT.—Prest. and Treas., Hon. A. A. Thibaudeau, Montreal. Secy., J. H. Le Febvre; Supt., R. Rinfret. Rept. Jan. 19, '97. SEWERS.—None.

2. **FREDERICTON,** York Co. (6,502.) Built in '82-3 by city. SUPPLY.—River St. John, pumping direct. PUMPS.—Cap., 3,300,000 galls.; 1,500,000 Holly-Gaskill hor. high-duty; 1,800,000 Northey. Bituminous coal used; av. cost, $2.96 per short ton. FILTER CRIB.—Broken stone, in river. FISCAL YEAR CLOSED Oct. 31. DISTRIBUTION.—Mains, 10½ miles; cost extensions met by issuing debentures. Taps, 845; made by city. Services, iron and lead; paid for by city. Meters, 5; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one, but City Council discourages their use; compulsory for factories. Hydrants, public, 86. CONSUMPTION.—(Galls.) av., 600,000; max., 840,000; min., 480,000. PRESSURE.—Ordinary, 40 lbs.; fire, 60 to 100 lbs. FINANCIAL.—Cost, $117,552. Bonded debt, $106,000, at 5%; due in 30 yrs. Expenses, $11,492: Operating, $6,192; int., $5,300. Revenue, $10,060: Consumers, unmetered, $7,599; metered, $306; City, fire protection, $1,610; street sprinkling, $200; public buildings and other purposes, $343. Deficits of about 9% last yr. met by general taxation. MANAGEMENT.—Water Comrs.; Chn., Israel Golding; Secy., Chas. W. Beckwith; City Treas., John Moore; Ch. Pump. Engr., Malcolm Ross. Rept. by Supt., Alex. Burchill, July 11, '96. SEWERS.—Has storm sewers only. REFERENCE.—Eng. News, Jan. 26, '84.

3. **HARTLAND,** Carleton Co. (Est., 400.) Built in '95 by town. Engr., D. Munroe. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 120,000 galls. FISCAL YEAR CLOSED July 1, '96. DISTRIBUTION.—Mains: Cost extensions met by bonds. Taps, 25. Services, lead; paid for by consumer. Hydrants, public, 9. PRESSURE.—Ordinary and fire, 45 lbs. FINANCIAL.—Cost, $7,000. Bonded debt, $7,000, at 6%; due in 10 yrs. Revenue: City, fire protection, $440. MANAGEMENT.—Comrs.; Chn., J. B. Curts. Rept. by Secy., S. J. Brown, July 27, '96. SEWERS.—None.

4. **MONCTON,** Westmoreland Co. (8,763.) Bought by city June 1, '95; built in '78 by Moncton Gas Light & Water Co. SUPPLY.—Northwest branch of Hall's Creek, by gravity, with pumping as auxiliary. PUMP.—Cap., 1,800,000 galls.; Blake comp. cond.

*The aim has been to give the capacities of all pumps, reservoirs, etc., in U. S. gallons. Confusion has arisen in this matter, owing to the fact that some Canadians have used Imperial and others U. S. gallons in making their repts., without indicating which.

Culm used; av. cost, $1.81 per short ton. RESERVOIR.—Cap., 180,000,000 galls.; two impounding: No. 1, 168,000,000; No. 2, 12,000,000, in course of construction. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 15 miles; cost extensions met by surplus earnings. Taps, 984; made by city, free. Services, lead; paid for by city to street line. Meters: 7; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one; compulsory for Intercolonial Ry. Wks. Hydrants, public, 52; private, 13, owned by Ry., cotton factory, sugar refinery, etc. CONSUMPTION.—(Galls.), av., 1,680,000. PRESSURE.—Ordinary, 35 lbs. Two steam fire engines are used. FINANCIAL.—Cost, $199,214. Bonded debt, $410,000; includes water, gas and electric light plants. Expenses: Operating, $19,000, including int. on bonds. Revenue, $26,000. A surplus exists at the present time. MANAGEMENT.—Secy. and Treas., Mathew Lodge; Ch. Pump. Engr., Jas. Wooten. Rept. by Supt. and Engr., John Edington, July 16, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 5, '83.

5. **SAINT JOHN,** Saint John Co. (39,179.) Bought by city in '85; built in '36 by Co. Carleton united with St. John in '89 and works built in '60 to supply it were consolidated with city plant. SUPPLY.—East side: Little River, by gravity; West side: Spruce Lake, by gravity. RESERVOIRS.—West Side: Cap., 2,400,000 galls.; East Side: Impounding, on Little River; area, 37½ acres; 160 ft. above city datum. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 68.4 miles; cost extensions met by issue of bonds. Taps, 5,289; made by city, free. Services, lead; paid for by city. Meters: 169; owned, controlled and repaired by city. Use of meters optional with city; compulsory for hotels, stables and factories. All property is assessed for water and all are entitled to supply. Hydrants, public, 338; private, 3. CONSUMPTION.—(Galls.) av., 6,519,840. PRESSURE.—Ordinary, 62½ lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,209,898. Bonded debt, $508,500: $300,000 at 6%; due in 1911; $20,000 at 4%; due in 1925-28; $160,000 at 6%; due in 1915; $28,500, at 6%; due 1917. Sinking Fund: $13,338, in bank. Expenses, $103,340: Operating, $21,428; int., $81,912. Revenue, $87,057: Consumers, unmetered, $72,654; metered, $14,403. MANAGEMENT.—Chn. Dept. Pub. Wks., Wm. Christie. Dir. Pub. Wks., A. Chipman Smith. Rept. by Supt. and Engr., Wm. Murdock, July 16, '96. PROJECTED IMPROVEMENTS.—Improvement of pressure on heights by introduction of small pumping plant driven by water power. SEWERS.—Has sanitary and storm sewers. REFERENCES.—Eng. News, Apr. 29, '82, old Carleton works, May 5, '83.

13 Me. **SAINT STEPHENS AND MILLTOWN,** Charlotte Co. (St. Stephens, 2,680; Milltown, 2,146.) Built in '86-7 by St. Croix Water Co.; sold in '91 to Maine Water Co. and combined with Calais (Me.) plant, which see (page 4).

P 1. **SUSSEX VALE,** Kings Co. (Est., 1,000.) Works are talked of, ownership uncertain, but may be built by Co. in connection with electric lighting plant. Supply, wells. Address Geo. H. White.

6. **WOODSTOCK,** Carleton Co. (3,288.) Built in '84 by town. SUPPLY.—River Saint John, pumping direct and to stand-pipe. PUMPS.—Cap., 2,000,000 galls.; Burrell Johnson Iron Co. dup. comp. Mill wood used. STAND-PIPE.—Cap., 344,400 galls.; iron, 35 × 40 ft., on stone foundation on elevated portion of town. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 6.7 miles; cost extensions met by general assessments. Taps, 560; made by town, free. Services, w. i.; paid for by town. Meters: 43; owned, 16 by town, 27 by consumers; controlled by town; repairs paid by owner of meter; yearly rental, $3 to $4. Town can compel use of meters, and any consumer may have one by purchasing it with approval of Supt.; compulsory for manufacturers, livery stables, and hotels. Hydrants, public, 74; private, 4. CONSUMPTION.—(Galls.) av., 198,000; max., 208,000; m'n., 163,200. Greatest consumption in March; least in May. PRESSURE.—Ordinary, 30 lbs.; fire, 80 to 100 lbs. FINANCIAL.—Cost, $77,000. Debt, $77,000, at 4½ and 4½%. Expenses, $5,811: Operating, $2,349; int., $3,462. Revenue, $5,384: Consumers, unmetered, $3,879; metered, $1,460; other purposes, $45 (meter rents). Deficits are met by general taxation. MANAGEMENT.—Mayor, W. S. Saunders; Treas., W. Fisher; Ch. Pump. Engr., Geo. Hendry. Rept. by Supt., Donald Munro, July 28, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Oct. 31, '85.

NOVA SCOTIA.

1, D 1. **AMHERST,** Cumberland Co. (3,781.)

CITY PLANT.

Built in '92; put in operation in Sept. Des. Engr., J. Ambrose Pickett. Con. Engr., C. E. W. Dodwell. Contrs., Garson & Purcer. SUPPLY.—Nappan River, pumping to reservoir. PUMPS.—Cap., 1,200,000 galls.; Northey dup. Spring Hill slack used; av. cost, $2.50 per short ton. FILTERS.—Cap., 600,000 galls.; sand. RESERVOIR.—Cap.,

3,600,000 galls.; storage and distributing, 1½ miles from center of distribution. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 9 miles; cost extensions met by bonds. Taps, 450; made by town, free. Services, lead; paid for by town to street line. Meters, 0. Any consumer may have a meter. Hydrants, public, 42; private, 5. CONSUMPTION.—(Galls.) av., 150,000. PRESSURE.—Ordinary, 60 lbs.; fire, 75 to 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $90,000. Bonded debt, $90,000: $30,000 at 4¾%; $50,000 at 4½%; $10,000 at 4%; no sinking fund. Expenses, $5,625: Operating, $1,637; int., $3,988. Revenue, consumers, $3,544. Deficits are met by general assessment on rate payers within water district. MANAGEMENT.—Supt. and Ch. Pump. Engr., Charles Campbell. Rept. by Secy. and Treas., W. Fred'k Donkin, July 16, '96. SEWERS.—None.

AMHERST WATER-WORKS CO.

Built in '87-8. Supply, springs, by gravity to 10,000-gall. reservoir. Mains, 4 miles. Taps, 50. (In '88.) Cost, $6,000. No debt. Expenses, $300. No rept. since '90-1 Manual.

2. **ANTIGONISHE,** Antigonishe Co. (Not given.) Built in '90-1 by town. SUPPLY.—Brook, by gravity from impounding reservoir. RESERVOIR.—Cap., 3,600,000 galls. FISCAL YEAR CLOSED Dec. 1, '95. DISTRIBUTION.—Mains, 7 miles; cost extensions met by town revenue. Taps, 500; made by town. Services, iron; paid for by town to property line. Meters, 0. Hydrants, public, 27. CONSUMPTION.—(Galls.) av., 840,000; max, 1,200,000; min., 600,000. PRESSURE.—Ordinary, 70 lbs.; fire, 135 lbs. FINANCIAL.—Cost, $42,000. No sinking fund. Expenses: Operating, $200. Revenue pays all operating expenses and int. on bonds. MANAGEMENT.—Rept. by Supt., W. J. Landry, Aug. 14, '96. SEWERS.—None.

3. **ANNAPOLIS,** Annapolis Co. (Est., 1,000.) Built in '89 by town. SUPPLY.—Lake, by gravity. Area of lake, 24 acres; av. depth, 25 to 30 ft.; 350 ft. above level of town. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4½ miles; cost of extensions met by special assessment. Taps, 160; made by town, free. Services, enamelled pipe; paid for by town. Use of meters optional with consumer. Hydrants, public, 28. CONSUMPTION.—(Galls.) av., 180,000. PRESSURE.—Ordinary, 90 lbs.; fire, 160 lbs. FINANCIAL.—Cost, $31,000. Bonded debt, $25,000 at 5%; due in from 25 to 60 yrs. Expenses: Operating, $400. MANAGEMENT.—Supt., Saml. Reppey. Rept. by Treas., R. J. Uniacke, June 15, '96. SEWERS.—None.

4. **BRIDGETOWN,** Annapolis Co. (Est., 800.) Built in '85 by town. SUPPLY.—Mountain springs, by gravity from storage reservoir. RESERVOIR.—Cap., 750,000 galls.; elev., 276 ft. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 4 miles. Taps, 230; made by plumber for $8. Services, galv. i.; paid for by property owner. Meters, 0. Use of meters optional with consumer. Hydrants, public, 21; private, one, at county asylum. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $22,600. Bonded debt, $20,000 at 5%; due in 1907. Floating, none. No sinking fund. Expenses, $2,600: Operating, $300; int., $1,000; taxes, $1,300. MANAGEMENT.—Prest., Frederick Fay. Rept. by Secy. and Supt., Jno. L. Cox, June 10, '96. SEWERS.—Has partial sewer system.

5. **CANNING,** Kings Co. (Est., 1,000.) Bought by town in '94 for $25,000; built in '93 by Co. Engr., Prof. Butler, Windsor. Contr., S. Blenkhorn. SUPPLY.—Mountain streams, by gravity from impounding reservoir. RESERVOIR.—Cap., 2,400,000 galls. FISCAL YEAR CLOSED May 13, '96. DISTRIBUTION.—Mains, about 3 miles. Taps, 90; made by town for $5, including service to sidewalk, and 1-yr. rental. Services, galv. i. Meters, 0. Use of meters optional with consumer. Hydrants, public, 30. PRESSURE.—Ordinary and fire, 60 to 80 lbs. FINANCIAL.—Cost, $26,700. Bonded debt, $25,600, at 5%. Sinking Fund: $1,600, in bank. Expenses: Operating, $300. Deficits are met by general taxation. MANAGEMENT.—Comrs.; Chn., Jno. Nicholson. Rept. by Clk. and Treas., H. Blenkhorn, Aug. 14, '96.

6. **DARTMOUTH,** Halifax Co. (6,249.) Built in '92 by town; put in operation in Nov. Des. Engr., E. H. Keating, Toronto. Const. Engr., W. G. Yorston, Truro. Contr., D. Sutherland. SUPPLY.—Lamont and Topsail Lakes, by gravity. Lakes are 3½ miles distant, and 225 ft. above mean tide of Halifax harbor. Lamont Lake has area of 22, and Topsail of 141 acres; combined drainage area excluding water surface, 588 acres, mostly wooded. SUPPLY MAIN.—Cast iron, 12,600 ft. long; 20 ins. for about 3,300 ft. of upper end and 12 ins. for balance. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains: Cost extensions met by bonds. Taps, 460; made by town, no fee. Services, lead; paid for by town to street line. Meters: 5; owned, controlled and repaired by town. Town can compel use of meters and any consumer may have one; compulsory for a few large consumers. Hydrants, public, 54. CONSUMPTION.—Unknown. PRESSURE.—Ordinary and fire, 40 to 90 lbs. Steam fire engines are used on outskirts of town. FINANCIAL.—Cost, $138,500. Debt, $139,700: Floating, $1,200 at 6%; Bonded, $138,500, at 4½%; due in 1913 and '14. Sinking Fund: $9,540, invested, part at 4½% in municipal bonds, balance at 3½% in savings bank. Expenses, $6,961: Operating, $884; int., $6,097. Revenue, $6,947: Consumers, $6,076; school buildings, $20; other purposes, $851. MANAGEMENT.—Mayor, W. H. Sterns; Supt., W. L. Bishop. Rept. by Secy. and Treas., A. Elliot, Aug. 14, '96. SEWERS.—Has sanitary and storm sewers.

7. **DIGBY,** Digby Co. (120.) Built in '95 by town; put in operation Nov. 1. Engrs., I. A. Pickett and T. Farnsworth. Contrs., Wood & Vye. SUPPLY.—Springs, 3½ miles from town, impounded by gravity. RESERVOIRS.—Cap., 10,800,000 galls.; impounding, 10,200,000; distributing, 600,000. DISTRIBUTION.—Mains, 8 miles; cost extensions met by taxes. Taps, made by town, including service to curb line free of charge. Services, lead; paid for by owner from curb line. Meters, 0. Use of meters optional with consumer. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 15,000; max., 20,000; min., 10,000. PRESSURE.—Ordinary, 80 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $37,000. Floating debt, $35,000, at 3½%. Expenses: Operating, not determined. MANAGEMENT.—Prest., T. C. Shreve; Secy. and Treas., C. Jamison. Rept. by Supt., T. Farnsworth, Sept. 1, '96. SEWERS.—None.

8. **HALIFAX,** Halifax Co. (38,556.) Bought by city in '61; built in '45-8 by Co. SUPPLY.—Long, Upper and Lower Chain lakes for low, and Spruce Hill lakes for high service, by gravity. RESERVOIRS.—Long Lake: 800,000,000 galls; drainage area, 6 sq. miles; surface area, 300 acres. Lower Chain Lake: 200 ft. above sea, and 3½ miles from city. Spruce Lake: Area, 170 acres; 360 ft. above sea, and 9 miles from city. DISTRIBUTION.—Mains, 58 miles. Taps (in '90), 14,244. Meters, 139. Hydrants, 368. PRESSURE.—Ordinary, 10 to 50 lbs.; fire, 25 to 70 lbs. FINANCIAL.—Cost, $1,050,000. Bonded debt, $1,050,000, at 4 to 5%. Expenses: Operating, $16,000. Revenue: Consumers, $30,000. MANAGEMENT.—Rept. by Supt., F. W. W. Doane, Mar. 22, '97. SEWERS.—Has combined system. REFERENCE.—Eng. News, Sept. 10, '81.

9. **KENTVILLE,** Kings Co. (1,686.) Built in '87 by city. SUPPLY.—Mill Brook, by gravity to reservoirs. RESERVOIRS.—Cap., 3,500,000 galls.; two: 3,000,000 and 500,000. DISTRIBUTION.—Mains, 5.5 miles. Taps, 151. Hydrants (in '88), 29. PRESSURE.—(In '89.) 100 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $30,000, at 5%. Expenses, $1,794: Operating, $294; int., $1,500. Revenue: Consumers, unmetered, $887. NOTE.—No rept. since '90-1 Manual.

10. **LUNENBURG,** Lunenburg Co. (4,044.) Built in '96 by Lunenburg Water, Electric Light, Heating & Power Co.; put in operation Oct. 30. Engr., C. O. Foss, Bridgewater. Contr., C. L. Goodhue, Springfield, Mass. FRANCHISE.—Perpetual; provides for purchase of works at appraised value. Rates are not subject to regulation by city. Co. is not exempt from local taxes. Co. is negotiating with town for a 10-yr. contract for fire service. No legal difficulties. SUPPLY.—Lake, area 800 acres, pumping to reservoir. PUMP.—Cap., 600,000 galls.; Goulds water-power. RESERVOIR.—Cap., 1,680,000 galls.; distributing, on hill between lake and town, 225 ft. above tide water, one mile from pump and two miles from town. DISTRIBUTION.—Mains, 9 miles. Taps, about 250; made by Co. Services, galv. i.; paid for by Co. to curb. Meters, 0. Two printing offices and a foundry will be supplied by meter. Hydrants, public, 52 (were to have been set in fall of '96). CONSUMPTION.—(Galls.) av., 66,000. PRESSURE.—Ordinary, 45 to 90 lbs. Steam fire engines were in use at time rept. was made, but were to be discontinued when hydrants were in place. FINANCIAL.—Cost, about $100,000. Cap. Stock: Authorized, $50,000; all paid-up. Bonded debt, $50,000, at 6%; due in 1915. Expenses: Operating, not determined; int., $3,000; taxes, $480. MANAGEMENT.—Prest., J. Jos. Rudolf; Secy. and Treas., W. T. Lindsay; Ch. Pump. Engr., Thos. Cantelope. Rept. by Supt., W. L. Romkey, Aug. 3, '96. SEWERS.—Has sanitary and storm sewers.

11. **MIDDLETON,** Annapolis Co. (Est., 500.) Bought by town in Sept., '95, at appraised value; built by Co. in '92. SUPPLY.—Springs, by gravity from collecting reservoir 200 ft. above town. FISCAL YEAR CLOSED May 1, '96. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by town issuing debentures. Taps, 100. Services, galv. i.; paid for by town. Meters, 0. Town cannot compel use of meters. Hydrants, public, 16. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $27,000. Deficits and int. are met by a fire tax levied each yr. on real estate. MANAGEMENT.—Chn., H. E. Reid; Supt., E. S. Dodge. Rept. by Secy. and Treas., H. A. Beldon, Jan. 11, '97. SEWERS.—None.

12. **NEW GLASGOW,** Pictou Co. (2,595.) Built in '87-8 by town. SUPPLY.—East River, two miles from town, pumping to reservoir. PUMPS.—Cap., 2,000,000 galls.; 500,000 Blake or Knowles and one 1,500,000. Culm used; av. cost, $1.37 per short ton. FILTER BED.—Cap., 360,000 galls.; sand and gravel; area (in '90), about 1,600 sq. ft. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 7¾ miles; cost extensions met by assessment. Taps, 712; made by town, including service to curb. Services, lead; paid for by consumer. Meters: 9; owned and repairs paid by consumer; controlled by town. Town cannot compel but may prohibit use of meters. Hydrants, public, 44; private, 4. CONSUMPTION.—(Galls.) av., 240,000; max., 360,000. Consumption is about 84 galls. per head of population. PRESSURE.—Ordinary and fire, 100 lbs. FINANCIAL.—Cost, $101,000. Bonded debt, $100,000, at 4½%; due in 1915. Revenue, $7,553. MANAGEMENT.—Supt., D. Ormiston; Ch. Pump. Engr., F. W. Ormiston. Rept. by Secy., A. M. Fraser, Jan. 9, '97. SEWERS.—Has sanitary and storm sewers.

13. **NORTH SYDNEY,** Cape Breton Co. (2,513.) Built in '96-7 by town; put in operation in Jan., '97. Engr., C. M. Odell. Contr., S. E. McManus. SUPPLY.—Pottle's Lake, area 800 acres, fed by springs, pumping through distribution system to reservoir. PUMP.—Cap., 1,250,000 galls.; Worthington 6-cylinder triple exp. Culm or slack used;

av. cost $1 per short ton. RESERVOIR.—One mile from center of town, 200 ft. above sea level. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 6¼ miles. Taps, 84; made by town, free, including service up to 50 ft. from main. Hydrants, public, 46. PRESSURE.—Ordinary and fire, 75 lbs. One steam fire engine is used. FINANCIAL.—Cost, $50,000. Bonded debt, $50,000 at 4½%. MANAGEMENT.—Rept. by Des. Engr., Jan. 13, '97. PROJECTED IMPROVEMENTS.—Extending to Sydney Mines, a mining town of 2,500 population. SEWERS.—Has private sanitary and partial storm sewers.

P 1. **PICTOU,** Pictou Co. (3,403.) Town was prospecting in '96 for supply from artesian wells. Est. cost of such a supply, $60,000; of gravity supply from point five miles distant, $120,000. Latest rept. from F. Mackaracker, July and Oct., '96.

P 2. **SPRINGHILL,** Cumberland Co. (4,813.) Dec. 4, '96, people voted to build works at est. cost of $100,000 to $120,000. Engr., Prof. Butler, Windsor, N. S. Supply, brook 6½ miles distant, by gravity. Rept. by Town Clk., Dec. 14, '96.

14. **STELLARTON,** Pictou Co. (2,410.) Built in '92 by town; put in operation in Dec. Engr., J. F. Pickett. Contrs., McDonald, McKinnis & McLean. SUPPLY.—East River, pumping to reservoir. PUMP.—Cap., 900,000 galls.; Northey comp. cond. Culm used; av. cost, $1.11 per short ton. RESERVOIR.—Cap., 1,200,000 galls. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 3 miles. Taps, 140; made by town free, including service to street line. Services, lead; paid for by town. Meters, 1; owned, controlled and repairs paid by Arcadia Coal Co. Hydrants, public, 15; private, 1. CONSUMPTION.—(Galls.) av., 67,200. PRESSURE.—Ordinary, 65 lbs. FINANCIAL.—Cost, $30,619. Expenses, $3,439: Operating, $2,064; int., $1,375. Revenue, $2,064: Consumers, unmetered, $1,123; metered, $300; City, fire protection, $641. MANAGEMENT.—Mayor, W. G. Miller; Chn. W.-W. Com., Jno. McQuarrie; Ch. Pump. Engr., Wm. C. McDonald. Rept. by Supt., W. C. MacDonald, Sept. 7, '96. SEWERS.—None.

15. **SYDNEY,** Cape Breton Co. (2,426.) Built in '93 by city. Engr., J. A. Pickett, New Glasgow. No Contr. SUPPLY.—Stream, by gravity from impounding and storage reservoir. RESERVOIR.—Cap., 32,400,000 galls. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by taxation. Taps, 250; made by city. Services, lead; paid for by city. Meters, 0; any consumer may have one. Hydrants, public, 19. PRESSURE.—Ordinary, 45 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $55,750. Debt at 4½%. Sinking Fund, none. Deficits are all met by general taxation. MANAGEMENT.—Rept. by J. McDonald, Aug. 3, '96. SEWERS.—Has storm sewers only.

P 3. **SYDNEY MINES,** Cape Breton Co. (2,500.) See North Sydney (projected improvements).

16. **TRURO,** Colchester Co. (5,102.) Built in '75 by town. SUPPLY.—Surface water, by gravity and pumping direct. PUMPS.—Two Holly rotary. RESERVOIR.—Cap., 2,500,000 galls. DISTRIBUTION.—Mains, 8 miles. Taps, about 450. Hydrants, 45. FINANCIAL.—Bonded debt, $61,500. Expenses: Operating, $1,578. Revenue: Consumers, $2,525. NOTE.—No rept. since '90-1 Manual.

17. **WESTVILLE,** Pictou Co. (3,152.) Built in '95 by town; put in operation Dec. 1. Engr., J. A. Pickett, New Glasgow. Contrs., Jas. K. McDonald & Co. SUPPLY.—Middle River, pumping to storage reservoir. PUMPS.—Cap., 600,000 galls.; Northey comp. dup. Run of mine coal used; av. cost, $2 per short ton. RESERVOIR.—Cap., 1,800,000 galls.; storage, 360 ft. above river level. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7⅛ miles. Taps, 220; made by town. Services, lead; paid for by town to street line. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 35. CONSUMPTION.—(Galls.) av., 56,400. PRESSURE.—Ordinary and fire, 70 lbs. FINANCIAL.—Cost, $43,539. Bonded debt, $45,000, at 4½%; due in 1915. Sinking Fund, none. Expenses, $4,710: Operating, $1,000; int., $2,025; taxes, $1,685. Revenue, $3,007: Consumers, unmetered, $1,822; City, fire protection, $1,685. MANAGEMENT.—Mayor, Geo. E. Munro. Rept. by Supt., Alex. W. McLeod, July 28, '96. SEWERS.—Has limited sanitary sewers only.

18. **WINDSOR,** Hants Co. (2,837.) Built in '83 by city. SUPPLY.—Brook, by gravity, from impounding reservoir. RESERVOIR.—Area, 5 acres; 185 ft. above high tide. DISTRIBUTION.—Mains, 11 miles. Taps, 520. Hydrants, 46. FINANCIAL.—Cost, $50,000. Bonded debt, $52,000, at 5%; due 1902. Sinking Fund: $3,000, invested in debentures, at 4 and 5%. NOTE.—No rept. since '90-1 Manual. REFERENCE.—Eng. News, Aug. 2, '84.

19. **WOLFVILLE,** Kings Co. (1,963.) Built in '89-90 by town. SUPPLY.—Duncan's Brook, by gravity from impounding to distributing reservoir. RESERVOIRS.—Cap., 2,325,000 galls.: Impounding, 100,000; distributing, 2,225,000. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 6 miles. Taps, 300. Hydrants, public, 27. PRESSURE.—(In '89.) 75 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 4½%: $25,000, due in 1910; $10,000, due in 1912; $5,000, due in 1914. Annual sinking fund, $200. MANAGEMENT.—Water Com. of Town Council. Rept. by Town Clk., Frank A. Dixon, Oct. 17, '96.

20. **YARMOUTH,** Yarmouth Co. (6,689.) Bought by town July 1, '93; built in '81 by Yarmouth Water Co., apparently for domestic supply only: city extended works in '88, putting new plant in operation Jan. 1, '94; Engr., M. M. Tidd, Boston. Press rept.

states town paid Co. $238,244 for works. SUPPLY.—Lake George, by gravity from reservoir, and pumping direct in case of large fire. Lake is 9 miles long; av. width, 1½ miles; 150 ft. above town. PUMPS.—Cap., 1,860,000 galls.; 2—930,000 triple, driven by four 30-HP. electric motors. RESERVOIR.—Cap., 2,400,000 galls. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 23 miles. Taps, 1,000; made by town, free. Services, lead; paid for by town. Meters: 4; owned, controlled and repaired by town. Use of meters optional with town; compulsory for hotels and steamboats. Hydrants, public, 86; private, 4. CONSUMPTION.—(Galls.) av., 96,000. PRESSURE.—Ordinary, 50 lbs.; fire, 80 lbs. Steam fire engines are used on high points. FINANCIAL.—Cost, $327,000. Expenses: Operating, $3,000. Revenue, $16,250: Consumers, unmetered, $12,500; metered, $300; City, fire protection, $3,000; street sprinkling, $150; public buildings, $300. Revenue about pays cost of extensions and int. on bonds. MANAGEMENT.—Mayor, J. R. Wyman; Treas., Hiram Goudey. Rept. by Supt., Geo. H. Robertson, June 27, '96. SEWERS.—Has sanitary sewers. REFERENCE.—Eng. News, Apr. 26, '84.

PRINCE EDWARD ISLAND.

1. **CHARLOTTETOWN**, Queens Co. (11,373.) Built in '88-9 by city. SUPPLY.—Open well, 22 × 28 ft., pumping to reservoir. Well is about 25 ft. from Three Mile Brook, which has drainage area of about 900 acres. PUMP.—Cap., 2,400,000 galls.; Blake comp. direct-acting. Cape Breton (New Campbellton Mine) coal used; av. cost, $3.60 per short ton at station, 2½ miles from city. RESERVOIR.—Cap., 2,400,000 galls.; distributing, one mile from city. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 18¼ miles; cost extensions met by capital. Taps, 1,673; made by city, free. Services, lead and galv. i.; paid for by consumer. Meters: 4; owned by consumer; controlled by city. City can compel use of meters and any consumer may have one; compulsory for steamships. Hydrants, public, 92; private, 2. CONSUMPTION.—(Galls.) av., 431,550. PRESSURE.—Ordinary and fire, 60 lbs. FINANCIAL.—Cost, $208,841. Floating debt, $198,000, at 4 and 5%. Sinking Fund: $9,195, invested at 4%. Expenses, $18,115: Operating, $3,595; int., $9,520. Revenue: City, fire protection, sewer flushing, and other purposes, $13,288. Deficits are met by taxation. MANAGEMENT.—Chn., D. Laird; Supt., Chas. Dalziel; Ch. Pump. Engr., John Mac Donald. Rept. by Secy., D. Mac Lean, June 9, '96. SEWERS.—None.

P 1. **SUMMERVILLE**, Kings Co. (150.) Works may be built by village in '97. Supply, Pickerings Brook. Est. cost, $60,000. Rept. by W. K. McKay, June 16, '96.

GROUP X.—CANADIAN INTERIOR AND WESTERN PROVINCES.

Water-Works Completed, in Process of Construction or Projected, in Quebec, Ontario, Manitoba, Northwest Territories and British Columbia.

(EXPLANATORY NOTE.—The populations, in parentheses, follow directly after the names of the counties, and are the U. S. Census figures for 1890 (or Canadian for 1891), except when otherwise stated. In some cases village populations could not be separated from those of the township in which the villages are located. The words "Rept. by," at or near the close of each description, merely indicate the person who submitted written information for this issue of the Manual, and are not designed to make that person responsible for all the information given, some of which has been taken from previous Manuals, printed annual reports and various other approved sources. The letter D prefixed to the number of each municipality indicates that a domestic supply, only, is furnished. In like manner F indicates fire protection, and P, projected work. A short dash and interrogation mark indicate uncertainty regarding the proper classification.)

QUEBEC.

1. **AYLMER,** Ottawa Co. (1,945.) Built in '95 by W. J. Poupore; put in operation in Sept. or Oct. Engr., J. Emile Vanier, Montreal. Contr., W. J. Poupore, Morrisburg, Ont. FRANCHISE.—Unlimited; provides for purchase of works by town at any time. Rates are regulated by franchise. Owner is not exempt from local taxes and there is no compensation for public service. No legal difficulties. SUPPLY.—Lake Deschene, an enlargement of Ottawa River, pumping to tank and direct. Intake, 12-in., 1,000 ft. long. PUMPS.—Cap., 2,400,000 galls.; 2—1,200,000 Worthington; a comp. dup. and a dup. high-pressure. Wood used; av. cost, $2 per cord. TANK.—Cap., 72,000 galls.; ¼-in. plate, enveloped by wooden jacket tinned over, at distance of 12 ins. from tank; 20 × 25 ft., on steel trestle 50 ft. high. DISTRIBUTION.—Mains, 3½ miles. Taps, 500; made by Propr. Services, lead; paid for by Propr. from main to street line. Meters, 1; owned, controlled and repaired by Propr.; yearly rental, 10% of cost. Use of meters optional with consumer; compulsory for large consumers; one gardener is metered. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 90,000; max., 12,000; min., 7,200. PRESSURE.—Ordinary, 60 lbs.; fire, 130 lbs. One steam fire engine is used. FINANCIAL.—Cost, $45,000. Expenses: Operating, $2,000. MANAGEMENT.—Proprietor, W. J. Poupore, Morrisburg, Ont. Ch. Pump. Engr., N. Le Blanc. Rept. by Supt., Archie McDonald, and Des. Engr., Sept. 28, '96. SEWERS.—None.

2. **BEAUHARNOIS,** Beauharnois Co. (1,590.) Built in '90 by town; put in operation in Oct. SUPPLY.—St. Lawrence River, pumping direct. Water is taken 2,000 ft. from shore. PUMPS.—Cap., 900,000 galls.; Blake comp. cond. dup. DISTRIBUTION.—Mains, 3.2 miles. Taps, 320. Services, lead. Meters, 0. Hydrants, 18. CONSUMPTION.—(Galls.) av., 102,000. PRESSURE.—Ordinary, 40 lbs.; fire 90 lbs. FINANCIAL.—Cost, $32,000. Debt, $32,000: Floating, $2,000 at 5%; Bonded, $30,000. MANAGEMENT.—Secy. and Treas., L. C. Tarse. No Supt. Rept. by J. Emile Vanier, Des. Engr., Sept. 25, '96.

3. **BEEBE PLAIN,** Stanstead Co. (372.) Built by town; put in operation Nov., '94. Engr., A. L. Husbands, Cookshire; Contr., M. D. Spear, Newport, Vt. SUPPLY.—Springs, by gravity to and from reservoir. FISCAL YEAR CLOSED Nov. 1, '95. DISTRIBUTION.—Mains, 2½ miles. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 20. PRESSURE.—Ordinary, 70 lbs. FINANCIAL.—Cost, $9,000. MANAGEMENT.—Rept. by Secy. and Treas., C. E. Kennedy, Aug. 31, '96. SEWERS.—None.

4. **BERTHIER,** Berthier Co. (1,587.) Built in '79 by J. U. Foncher. SUPPLY.—St. Lawrence River, pumping to tank and direct. PUMPS.—Two Worthington. TANK.—Cap., 57,000 galls.; 27 x 13 ft., 40 ft. above ground. DISTRIBUTION.—Mains, 3 miles. Taps, 300. Hydrants, public, 15. PRESSURE.—(In '89.) Ordinary, 20 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $22,000. Expenses, $1,000. Revenue, $2,400. NOTE.—No rept. since '90-1 Manual. REFERENCE.—History and statistics, Eng. News, Mar. 22, '84.

—? **BOUCHERVILLE,** Chambly Co. (821.) E. L. de la Vallee & Son, Montreal, rept. they were Contrs. for works here.

5. **BUCKINGHAM,** Ottawa Co. (2,289.) Built in '98 by town; put in operation in Nov. Engr., J. Emile Vanier, 107 St. James St., Montreal. No Contr. SUPPLY.—River Du Lievre, pumping direct. PUMP.—Cap., 1,500,000 galls.; Knowles dup. water power. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6½ miles; cost extensions met by bonds. Taps, 600; made by town, no fee. Services, lead; paid for by property owner. Meters, owned, controlled and repaired by town. Use of meters optional with consumer. Hydrants, public, 49; private, 2. CONSUMPTION.—(Galls.) av., 360,000. PRESSURE.—Ordinary, 50 lbs.; fire, 90 lbs. FINANCIAL.—Cost, about $60,000. Expenses: Operating, $1,000. Revenue, $5,620: City, fire protection, $1,120; other purposes, $4,500. MANAGEMENT.—Secy. and Treas., F. M. Gorman; Supt., John Cosgrove; Ch. Pump. Engr., John Blais. Rept. by Des. Engr., Sept. 30, '96. PROJECTED IMPROVEMENTS.—New pump and elevated tank. SEWERS.—No sanitary but a few storm sewers.

6. **CHAMBLY BASIN AND CHAMBLY CANTON,** Chambly Co. (C. Basin, 879; C. Canton, 846.) Built in '96 by towns; were to be put in operation Jan. 1, '97. Engr., E. L. de la Vallee Poussin. Contrs., Lafountaine & Lemoine, Chambly. In '91 a Co. was granted a 25-yr. franchise, as noted in '90-1 Manual, but did not build works. SUPPLY.—Rapids of Richelieu River, pumping direct. "Contract with S. T. Willett for 10 yrs." (for pumping ?). DISTRIBUTION.—Mains, 3 miles. Hydrants, public, 50. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $30,000. Revenue, $2,500. MANAGEMENT.—Rept. by E. P. Bertrand, Chambly Basin, Sept. 26, '96.

—? **CHICOUTIMI,** Hicoutimi Co. (2,277.) E. L. de la Vallee & Son, Montreal, rept. they were Contrs. for works here.

7. **COATICOOK,** Stanstead. (3,086.) Built by Coaticook Water Co., prior to '92. Mgr., J. B. Gendreau.

8. **COOKSHIRE,** Compton Co. (400.) Built in '94 by town; put in operation in Dec. Engr., A. L. Husbands; Contr., M. B. McAulay. SUPPLY.—Seven springs, by gravity to and from reservoir. RESERVOIR.—Cap., 600,000 galls.; on hill above town. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by funds of town. Taps, 25; made by town. Services, iron; paid for by town to property line. Hydrants, public, 40. PRESSURE.—Ordinary, 65 to 163 lbs.; town is built on a steep hill. FINANCIAL.—Bonded debt, $30,000, at 6%; due in 30 yrs. Expenses: Operating, $900. Revenue: Consumers, $356. 55% of deficits are met by general taxation. MANAGEMENT.—Rept. by Secy. and Treas., E. S. Baker, July 31, '96. SEWERS.—Has sanitary and storm sewers.

21. **COTE DES NEIGES,** Hochelaga Co. (391.) See Montreal Water & Power Co., under Montreal.

21. **COTE SAINT ANTOINE,** Hochelaga Co. (3,076.) Now owned by Montreal Water & Power Co.; built in '83 by Cote Saint Antoine Water Co. See Montreal Water & Power Co., under Montreal. SUPPLY.—See Co., under Montreal. DISTRIBUTION.—Mains, 3 miles. Taps (in '87), 170. Meters, 180. Hydrants, 4. FINANCIAL.—Cost, $19,000. Expenses, $908. Revenue, $3,209: Consumers, $2,879; City, fire protection and street sinking, $330. NOTE.—No official rept. since '90-1 Manual. See Co. under Montreal. REFERENCE.—Eng. News, Apr. 19, '84.

21. **COTE SAINT LOUIS,** Hochelaga Co. (2,972.) Now St. Denis Ward of Montreal. See Montreal Water & Power Co., under Montreal.

21. **COTE SAINT PAUL,** Hochelaga Co. (842.) Built in '98 by Montreal Water & Power Co. (See Montreal.) Des. Engr., J. Emile Vanier, 107 St. James St., Montreal. Contrs., Dominion Constn. Co. FRANCHISE.—50 yrs. from '91; provides for purchase of works by city at end of 25 yrs. Rates are fixed in franchise. Co. is exempt from local taxes, but receives no compensation for public service. SUPPLY.—See Co., under Montreal. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Taps, 400; made by Co. Services, lead; paid for by Co. to street line. Hydrants, public, 30. PRESSURE.—Ordinary and fire, 130 lbs. Steam fire engines are used. FINANCIAL.—Cost, $40,000. MANAGEMENT.—See Co., under Montreal. Rept. by Des. Engr., Sept. 30, '96. SEWERS.—None.

21. **COTE LA VISITATION,** Hochelaga Co. (816.) See Montreal Water & Power Co., under Montreal.

P 1. **COWANSVILLE,** Missisquoi Co. (639.) Press repts. state people voted, 50 to 10, for municipal works in Nov., '96; also that Stadacona Water, Light & Power Co., of Montreal, claimed exclusive right to build works (see Sweetsburg).

9. **DRUMMONDVILLE,** Drummond Co. (1,955.) Built in '87-8 by Comtois & Poirier. SUPPLY.—St. Francis River, pumping to reservoir and tanks. PUMPS.—Cap., 36,000 galls. TANKS.—Each 12 × 6 ft. DISTRIBUTION.—(In '88.) Mains, 3 miles. Taps, '90. Hydrants, 12. PRESSURE.—(In '89.) 40 lbs. FINANCIAL.—(In '88.) Cost, $7,000. Debt, $5,000, at 8%. Expenses, $550: Operating, $150; int., $400. Revenue, $1,000. NOTE.—No rept. since '90-1 Manual.

10. **FARNHAM,** Missisquoi Co. (2,822.) Built in '91 by city. SUPPLY.—River,

pumping direct. PUMPS.—Cap., 1,200,000 galls.; from A. Williams, Toronto. DISTRIBUTION.—Mains, 6 miles. Taps, 350. Services, lead. Meters, 0. Hydrants, 80. PRESSURE.—Ordinary, 50 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $36,000. NOTE.—No rept. since '90-1 Manual.

11. **GRANBY**, Shefford Co. (1,710.) Built in '95 by C. N. Peyton & Co. FRANCHISE.—10 yrs. from '94. Rates are subject to regulation by city. Co. is exempt from local taxes. City to pay $500 per yr. for public service. SUPPLY.—Lake on Shefford Mt., four miles distant, by gravity. RESERVOIR.—Stone, 100 ft. sq., 8 ft. deep. DISTRIBUTION.—Services, lead; paid for by property owner. Hydrants, public, 50. PRESSURE.—Ordinary and fire, 85 lbs. MANAGEMENT.—Prest., C. N. Peyton, Waterloo. Rept. by J. A. Tomkins, June 15, '96. SEWERS.—Has partial sanitary and storm sewers.

12. **HEDLEYVILLE**, Quebec Co. (Not given.) Built in '95 by city; put in operation in Oct. Engr. and Contr., E. L. de la Vallee Poussin, Montreal. SUPPLY.—Springs, probably by gravity. DISTRIBUTION.—Mains, 6 miles. Taps, 315; made by city. Services, brass or lead; paid for by city. Meters: 4; controlled by city; repairs paid by consumer. Hydrants, public, 18; private, 5. CONSUMPTION.—(Galls.) av., 60,000; max., 72,000; min., 42,000. PRESSURE.—Ordinary, 90 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $72,000. Bonded debt, $72,000, at 4½%. Sinking Fund, invested at 5.15%. Expenses: Operating, $300. Revenue, $3,000. MANAGEMENT.—Mayor, P. Landry. Rept. by Des. Engr. and Contr., Sept. 5, '96.

13. **HULL**, Ottawa Co. (11,265.) Built in '96 by town. SUPPLY.—Brewery Creek, pumping direct. PUMPS.—Cap. (in '89), 1,000,000 gals.; four Knowles steam. DISTRIBUTION.—Services: Paid for by town to street line. Meters, 0. Town can compel use of meters, and any consumer may have one. Hydrants, public, 100. CONSUMPTION.—(Galls.) av., 180,000. PRESSURE.—Ordinary, 60 lbs.; fire, 80 lbs. Steam fire engines are used. FINANCIAL.—Bonded debt, $221,000, at 5%. Sinking Fund: $4,500, in Bank of Montreal at 3%. Expenses, $18,745: Operating, $7,695; int., $11,050. Revenue: Consumers, unmetered, $15,500. MANAGEMENT.—Chn. Fire and Water Com., R. W. Farley; Supt., L. Geneat; Ch. Pump. Engr., F. W. Butler. Rept. by Treas., A. F. Thibault, July 25, '96. SEWERS.—None.

14. **HUNTINGDON**, Huntingdon Co. (856.) Built in '96 by Stadacona Water, Light & Power Co., Montreal; put in operation Aug. 1. Engr., Jos. O'C. Mignault, Montreal. Contrs., La Palme & Perron. FRANCHISE.—25 yrs. from '96. Rates are subject to regulation by city. Co. is exempt from local taxes for 25 yrs. City to pay $600 a yr. for 30 hydrants. No legal difficulties. SUPPLY.—Chateauguay River, and wells, pumping direct. PUMPS.—Cap., 1,200,000 galls.; 340,000 and $60,000; one is an underwriters' fire pump. Coal used; av. cost, $4.66% per short ton. DISTRIBUTION.—Mains, 4¼ miles; cost extensions met by Co. Taps, 200; made by Co. for $1.50. Services, lead; paid for by consumer. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 180,000; max., 300,000; min., 96,000. PRESSURE.—Ordinary, 70 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $45,000. Expenses: Operating, $1,800. MANAGEMENT.—Rept. by Man. Dir., Louis H. Tache, July 8, '96. PROJECTED IMPROVEMENTS.—Windmill and water tank. SEWERS.—Has sanitary sewers only.

15. **IBERVILLE**, Iberville Co. (1,719.) Built in '81 by town. SUPPLY.—Richelieu River, pumping direct. PUMP.—12 × 18-in. steam and 7-in. water cylinders. DISTRIBUTION.—Mains, 6.3 miles: Taps, 525. Meters, 0. Hydrants, 20. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $33,000. No debt. Expenses, $1,500. Revenue, $2,500. NOTE.—No rept. since '90-1 Manual.

16. **JOLIETTE**, Joliette Co. (3,347.) Built in '73 by town. SUPPLY.—L'Assomption River, pumping direct. PUMPS.—Cap., 300,000 galls.; 7-in. rotary water-power and 7½-in. dup. DISTRIBUTION.—(In '88.) Mains, 7 miles. Taps, 2,000. Hydrants (in '96), 88. CONSUMPTION.—(In '88.) (Galls.) av., 240,000. PRESSURE.—(In '89.) Ordinary, 50 lbs.; fire, 80 lbs. FINANCIAL.—(In '88.) Cost, $50,000. Bonded debt, $50,000, at 5%. Expenses, $3,500: Operating, $1,000; int., $2,500. Revenue: Consumers, unmetered, $6,000. MANAGEMENT.—Rept. by Supt., Pierre Laforest. REFERENCE.—Eng. News, May 12, '88.

17. **KNOWLTON**, Brome Co. (600.) Built in '95 by village; put in operation in Aug. SUPPLY.—Springs, by gravity. RESERVOIR.—Cap., 750,000 galls.; 170 ft. above town. DISTRIBUTION.—Mains, 4 miles; cost extensions met by revenue for use of water. Taps, 90. Services, iron and lead; paid for by village. Hydrants, public, 21. PRESSURE.—Ordinary and fire, 72 lbs. FINANCIAL.—Cost, $16,500. Sinking Fund: Bonds at 4½% issued for this purpose. MANAGEMENT.—Rept. by Secy. and Treas., J. E. Fay, Sept. 1, '96. SEWERS.—None.

18. **LACHINE**, Jacques Cartier Co. (3,761.) Built in '89 by city. SUPPLY.—St. Lawrence River, pumping direct. PUMPS.—Cap., 2,400,000 galls.; 2—1,200,000 Blake comp. cond. dup. Bituminous coal used; av. cost, $3.50 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, about 9 miles; cost extensions met by bonds. Taps, 900; made by city, free. Services, lead; paid for by consumer from property line. Meters, 5; owned and repairs paid by consumer; controlled by city. City cannot compel, but may prohibit use of meters; compulsory for mills, breweries and factories. Hydrants, public, 70; private, 17. CONSUMPTION.—(Galls.) av., 300,000;

min., 150,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. Steam fire engines are used only rarely. FINANCIAL.—Cost, $95,000. Bonded debt, $115,000 at 4½%: $60,000 in 1909; $55,000 in 1910. Sinking Fund, none as yet; by-laws provide for a fund raised by 1% tax. Expenses, $9,741: Operating, $5,128; int., $4,613. Revenue, $10,570: Consumers, unmetered, $9,370; metered, $1,200. MANAGEMENT.—Supt., A. Themereau; Ch. Pump. Engr., Jos. Leclaire. Rept. by Secy. and Treas., H. Robert, Aug. 12, '96. SEWERS.—None.

—? **LA CHUTE,** Argenteuil Co. (1,751.) Built by La Chute Aqueduct Co.; have been out of operation for one year. FRANCHISE.—30 yrs. from '96. Co. is not exempt from local taxes. No legal difficulties. SUPPLY.—McOuats Brook, two miles from town, by gravity, through wooden pipes. FINANCIAL.—Cost, about, $30,000. MANAGEMENT.—Address, L. P. Rodrigue. Rept. by Jas. W. Raitt, Secy. and Treas. of town, Oct. 26, '96. PROJECTED IMPROVEMENTS.—New system.

12. **LIMOILOU,** Quebec Co. (Not given.) P. O. is Hedleyville, which see.

19. **LONGUEUIL,** Chambly Co. (2,757.) Built in '76 by town. SUPPLY.—St. Lawrence River, pumping direct. PUMPS.—Cap., 900,000 galls.; 600,000 Worthington; 300,000 Waterous. Bituminous coal used; av. cost, $3.34 per short ton. FILTERS.—Cap., 400,000 galls.; New York. FISCAL YEAR CLOSED June 30, '96. DISTRIBUTION.—Mains, 9 miles. Taps, 900; made by town, free. Services, lead; paid for by property owner. Hydrants, public, 52. CONSUMPTION.—(Galls.) av., 300,000; max., 390,000; min., 270,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $100,000. Expenses: Operating, $3,000; int., 4½%. MANAGEMENT.—Prest., Victor Pigeon; Supt. and Ch. Pump. Engr., J. O. Kouleau. Rept. by Secy., Magloire Dagenais, Oct. 6, '96. SEWERS.—Has complete sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 23, '84.

21. **MAISONNEUVE,** Hochelaga Co. (1,226.) Owned since '90 or '91 by Montreal Water & Power Co.; built by city. See Co., under Montreal. Engr., J. Emile Vanier, Montreal. Contrs., Bastien & Valiquette, Montreal. FRANCHISE.—50 yrs. from '91; provides for purchase of works by city at end of 25 yrs. Rates are fixed in franchise. Co. is exempt from local taxes but receives no compensation for public service. SUPPLY.—See Co., under Montreal. DISTRIBUTION.—Mains, 4 miles. Taps, 600; made by Co. Services, lead; paid for by Co. to street line. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary and fire, 75 lbs. FINANCIAL.—Cost, $45,000 MANAGEMENT.—Prest., Edwin Hanson; Secy., A. Carvell, 107 St. James St.; Treas., W. J. Common, all of Montreal; Supt., W. Leach. Rept. by J. Emile Vanier, Oct. 5, '96.

21. **MILE END,** Hochelaga Co. See Saint Louis du Mile End.

20, 21. **MONTREAL,** Hochelaga Co. (216,650.) Bought by city in '45 for about $200,000; built by Co. in '01. See Montreal Water & Power Co., below, for supply of St. Denis Ward. SUPPLY.—St. Lawrence River, pumping to reservoir and repumping to high service reservoir. PUMPS.—Low service, cap., 50,000,000 galls.: 18,000,000 water power (four McDougall); 2—12,000,000 and 1—8,000,000 Worthington steam (makers rept. smaller cap.). High service, 3,600,000 galls.: 1,200,000 Worthington; 2,400,000 Gilbert. RESERVOIRS.—Cap., 46,800,000 galls.: 44,400,000 low service, 200 ft. above harbor; 2,400,000 low service, 430 ft. above harbor. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 216 miles; cost extensions met by loan fund. Taps, 50,600; made by city, free. Services, lead; paid for by city. Meters, 840, of which 750 are owned by city; all controlled and repaired by city. Use of meters optional with city; compulsory for all commercial purposes. Hydrants, public, 1,695; private, 50. CONSUMPTION.—(Galls.) av., 18,345,269; max., 22,080,000; min., 10,119,600. PRESSURE.—Ordinary, 40 to 125 lbs.; fire, 40 to 187 lbs. Steam fire engines are used. FINANCIAL.—Cost, $8,600,000. Sinking Fund, none. Expenses: Operating, $144,500. Revenue: Consumers, $625,000. MANAGEMENT.—Prest., Richard Costigan; Secy., Frank Dowd; Ch. Pump. Engr., D. Kearney. Rept. by Supt., J. O. Alfred Laforest, July 17, '96. PROJECTED IMPROVEMENTS.—New aqueduct 100 ft. wide, about one-third completed. SEWERS.—Has combined system of sewers. REFERENCES.—Eng. News, May 21, '81; McTavish St. reservoir, June 21, '90; consumption, Mar. 22, '94.

MONTREAL WATER & POWER CO.

First known as Montreal Island Water & Electric Co., afterwards as above. Began operations about '89, and in '90 and '91 secured control of water supply in the seven municipalities adjoining Montreal (one of which has since been anexed to Montreal) and soon expects to supply three other municipalities, as stated below. From Jan. 30 to Oct. 8, '91, Co. bought the municipal plants supplying Cote St. Antoine, Cote St. Louis (now St. Denis Ward of Montreal), Maisonneuve, St. Cunegonde and St. Henri; within same period it also secured contracts to supply Cote St. Paul, St. Louis du Mile End and Outremont. Of the places named, Cote St. Paul and Outremont were without water when the contracts were made; St. Cunegonde owned complete works; the other five places had distribution systems (probably owned by municipalities, except Cote St. Antoine) and bought water by meter measurement from Montreal, under 5-yr. contracts, dated as follows: Cote St. Antoine and Maisonneuve, '84; Cote St. Louis, '96; St. Louis du Mile End, '89; Cote la Visitation, Oct., '91. The St. Cunegonde works were built in '79

and the St. Henri in '80, each by Berger & Beique, and each were bought by the respective cities in '90 or '91. Water for St. Henri was supplied from St. Cunegonde. The Cote St. Antoine plant was built by the St. Antoine Water Co., in '83. In March, '94, although four of the above contracts had expired, several years before, Montreal was still supplying the water consumed in the municipalities. SUPPLY.—St. Henri, St. Cunegonde, Westmount and Cote St. Paul, all on the west, are supplied from the St. Cunegonde works, by pumping from the St. Lawrence River direct and to a reservoir in Cote des Neiges (see St. Cunegonde). The supply of the four other municipalities, and the St. Denis Ward of Montreal, is still from the Montreal works, the Cote la Visitation contract with Montreal, direct, expiring in Oct., '96. All the municipalities named, together with Cote des Neiges and Outremont, will be supplied, on completion of the Co.'s works, by water power from the Riviere des Prairies (Back River), otherwise the water of the Ottawa River at the north side of the Island of Montreal. DISTRIBUTION AND FINANCIAL.—Withheld by Co. for the present, but figures regarding some of the municipalities are given separately, under them in their places. MANAGEMENT.—Prest., Edwin Hanson, Montreal. Secy., Albert Carvel, Imperial Bldg., Montreal.

21. **OUTREMONT,** Hochelaga Co. (408.) See Montreal Water & Power Co., under Montreal.

22. **QUEBEC,** Quebec Co. (63,090.) Built in '51-3 by city. SUPPLY.—Lake St. Charles, by gravity. RESERVOIR.—Cap., 120,000,000 galls.; impounding; area 84 acres. FISCAL YEAR CLOSED April 30, '96. DISTRIBUTION.—Mains, 65 miles; cost extensions met by bonds. Taps, 7,000; made by city, free. Services, lead; paid for by city. Use of meters is not allowed. Hydrants, public, 400; CONSUMPTION.—(Galls.) av., 12,000,000; max., 14,400,000; min., 9,600,000. PRESSURE.—Ordinary, 60 lbs.; fire, 80 to 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $2,250,000. Bonded debt, $2,250,000: $1,000,000 at 6%; due 1905; $500,000 at 6%; due 1908; $250,000 at 6%; due 1910; $500,000 at 5%; due 1914. Sinking Fund, none. Expenses, $150,000: Operating, $20,000; int., $130,000. Revenue, $592,800 (?). MANAGEMENT.—Prest., Jean Drolet; Treas., C. Lafrance. Rept. by Secy. and Supt., Jere Gallagher, June 25, '96. SEWERS.—Has combined sanitary and storm sewers. REFERENCES.—Eng. News, May 9, 16, 23, 30, '78, illus. River dam, June 21, '90.

23. **RICHMOND,** Richmond Co. (2,056.) Built in '82 by Lafontaine & Roussin. FRANCHISE.—Provides for purchase of works by city in 1900. Rates not subject to regulation by city. LEGAL DIFFICULTIES.—Press rept., July, '96, stated lower court had decided that proprietors had not fulfilled contract and had ordered pipes removed from street, but an appeal had been made to Court of Review. SUPPLY.—Source not given, by gravity from reservoir; filtered. RESERVOIR.—Area, ½ acre. DISTRIBUTION.—Mains, 2.5 miles. Taps, 300. Hydrants, 15. PRESSURE.—(In '89.) 50 lbs. FINANCIAL.—Cost, $16,500. Cap. Stock, authorized, $16,500; all paid-up. No debt. Expenses, $25. NOTE.—No rept. since '90-1 Manual.

11 Vt. **ROCK ISLAND,** Stanstead Co. (800.) Built in '93 (?) by W. C. Herbert; purchased by H. S. Haskell in '95 and consolidated with the plants at Derby Line, Vt., and Stanstead, Que., under the name of International Water-Works. See Derby Line, p. 25. FRANCHISE.—20 yrs. from '93. MANAGEMENT.—Rept. by owner, H. S. Haskell, Derby Line, Vt., Aug. 31, '96. SEWERS.—Has storm sewers only.

D 1. **SAINTE ADELE,** Terrebonne Co. (40.) Small system owned by Dr. W. Geignon, supplies water from creek in wooden pipes.

—? **SAINTE ANNE DE LA POCATIERE,** Kamouraska Co. (Not given.) E. L. de la Vallee & Son rept. they were contrs. for work here.

21. **SAINTE CUNEGONDE,** Hochelaga Co. (9,293.) Now owned by Montreal Water & Power Co.; built in '79 by Co.; bought by city in '91 and sold same year to above Co., which also see under Montreal. SUPPLY.—St. Lawrence River, pumping to reservoir. PUMPS.—Low service, cap., 5,100,000 galls.: 1,500,000 Holly quadruplex and 3,600,000 Snow comp. cond. dup. High service: Two, combined cap., 3,600,000, on Clarke avenue. Bituminous coal used; av. cost, $3.85 per short ton, delivered. RESERVOIR.—Cap., 8,616,000 galls.; two, storage and distributing, 8,400,000, 478 ft. above river, and 216,000, 200 ft. above river. DISTRIBUTION.—(In '90.) Mains, 17 miles. Taps, 5,000. Meters, 18. Hydrants, 24. FINANCIAL.—(In '90.) Cost, $425,000. Expenses, $30,000. Revenue, $42,000. MANAGEMENT.—See Co., under Montreal. REFERENCE.—Eng. News, Apr. 12, '84.

—? **SAINT EUSTACHE,** Two Mountains Co. (960.) Rept. in Jan., '97, that works were being built here.

21. **SAINT HENRI DE MONTREAL,** Hochelaga Co. (13,415.) Now owned by Montreal Water & Power Co.; built in '80 by Berger & Beique, and sold to city in '91. See Co., under Montreal. SUPPLY.—From Ste. Cunegonde. DISTRIBUTION.—Mains, 16 miles. Taps, 3,000. Meters, 125. Hydrants, 43. FINANCIAL.—Cost, $155,000. Revenue, $26,000. NOTE.—No rept. since '90-1 Manual. See Co., under Montreal, for management. REFERENCE.—Eng. News, Apr. 19, '84.

24. **SAINT HILAIRE,** Rouville Co. (300.) Built in '91 by Co. FRANCHISE.—25 yrs. City to pay $30 per yr. per hydrant. SUPPLY.—Source not given, probably lake,

by gravity. DISTRIBUTION.—Mains, 2 miles. Taps, 227. Services, lead. Hydrants, 6. PRESSURE.—70 lbs. FINANCIAL.—Cost, $15,000. Cap. Stock: Authorized, $15,000; paid-up, $10,000. NOTE.—No rept. since '90-1 Manual.

25. **SAINT HYACINTHE,** Saint Hyacinthe Co. (7,016.) Bought by city Nov. 1, '94; built in '75 by St. Hyacinthe Water-Works Co. SUPPLY.—Yamaska River, pumping direct. PUMPS.—Cap., 2,100,000 galls.: 1,200,000 Blake comp. dup.; 600,000 Knowles; 360,000 Blake high pressure. Old Sidney coal used; av. cost, $3.78 per short ton. FILTERS.—Cap., 1,200,000 galls.; 2—600,000, New York. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 36 miles. Taps, 1,520. Services, lead; paid for by city. Meters: 30; owned, controlled and repaired by city; yearly rental, $1.50. City can compel use of meters and any consumer may have one; compulsory for hotels, public buildings and R. Rs. Hydrants, public, 88; private, 6. CONSUMPTION.—(Galls.) av., 840,000; max., 720,000; min., 600,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Steam fire engines are used. FINANCIAL.—Cost, $132,000. Bonded debt, $150,000, at 4%. Expenses: Operating, $4,875. MANAGEMENT.—Prest., Joseph Morin; Secy., Robt. Deschenes; Ch. Pump. Engr., Arthur Chagnon. Rept. by Supt., M. A. Connell, June 8, '96. PROJECTED IMPROVEMENTS.—Change of location of pumping station for deeper water; addition of new 2,400,000-gall. pump. SEWERS.—Has sanitary sewers.

26. **SAINT JEROME,** Terrebonne Co. (2,868.) Built in '79-80 by town. SUPPLY.—Spring. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 15 miles. Services, wood; paid for by works. Meters; yearly rental, $6 or 20%. FINANCIAL.—Cost, $40,000. Floating debt, $52,000. Expenses: Operating, $600 or $800; taxes, $4,200. Revenue, $4,500. MANAGEMENT.—Supt., S. I. B. Rolland; Ch. Pump. Engr., Jos. Savard. Rept. by Secy. and Treas., E. Marchand, Jan. 18, '97.

27. **SAINT JOHNS,** Saint Johns Co. (4,772.) Built in '72 by Louis Molleur's Sons. SUPPLY.—Richelieu River, pumping direct and to reservoir. PUMPS.—Cap., 2,400,000 galls.; three dup. steam and one water power, all from Jno. McDougal, Montreal. RESERVOIR.—Cap., 27,000 galls. DISTRIBUTION.—Mains, 16 miles. Taps (in '88), 950. Hydrants, 39. PRESSURE.—(In '89,) Ordinary, 45 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $140,000. No debt. Expenses, $1,800. Revenue, $12,000. NOTE.—No rept. since '90-1 Manual.

21. **SAINT LOUIS DU MILE END,** Hochelaga Co. (3,537.) Present works built in '92 by Montreal Water & Power Co.; put in operation in Nov. Engr., J. Emile Vanier, 107 St. James St., Montreal. Contrs., Dominion Constn. Co., Montreal. Previously supplied through meter from Montreal. See Co., under Montreal. FRANCHISE.—50 yrs. from '91; provides for purchase of works by city at end of 25 yrs. Rates are fixed by franchise. Co. is exempt from local taxes. SUPPLY.—See Co., under Montreal. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8 miles. Taps, 2,000; made by Co. Services, lead; paid for by Co. to street line. Meters, 1; owned, controlled and repaired by Co.; yearly rental, about, 10%. Hydrants, public, about, 60. CONSUMPTION.—(Galls.) av., 480,000. PRESSURE.—Ordinary, 40 lbs. One steam fire engine is used. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Prest., Edwin Hanson; Secy., A. Carvell; Treas., W. J. Common; all of Montreal; Supt., W. Leach. Rept. by Des. Engr., Oct. 5, '96. SEWERS.—Has complete sanitary and storm sewers.

28. **SHERBROOKE,** Sherbrooke Co. (10,110.) Built in '80-1 by Sherbrooke Gas & Water Co. CONTRACT.—12 yrs. from '87; provides for purchase of works by city in 1905. Rates were agreed upon in contract. Co. is exempt from local taxes until 1905. City to pay $29 each per yr. for 63 hydrants. SUPPLY.—Magog River, pumping to reservoir. PUMPS.—Cap., 1,680,000 galls.; 2—840,000 Knowles, water-power. RESERVOIR.—Cap., 4,200,000 galls.; storage, 230 ft. above low level of city. FISCAL YEAR CLOSED Sept. 15, '96. DISTRIBUTION.—Mains, 12 miles; cost extensions met by bonds. Taps, 750; made by Co. only. Services, lead and galv. i.; paid for by consumer from sidewalk. Meters, 20; owned, controlled and repaired by Co.; yearly rental, $3. Use of meters compulsory for hotels and manufacturers. Hydrants, public, 63. CONSUMPTION.—(Galls.) av., 600,000. PRESSURE.—Ordinary, 30 to 100 lbs. Steam fire engines are used on high levels. FINANCIAL.—Cost, $157,436, including land and water power, gas and electric light. Cap. Stock: Authorized, $200,000; all paid-up; paid 6% div'd in '96. Debt, $125,300: Floating, $5,300 at 6%; Bonded, $120,000 at 5%; due in 1904. Sinking Fund, none. Expenses: Operating, $4,000. Revenue, $17,100: Consumers, $15,000; City, fire protection, $1,800; street sprinkling, $300. Surplus invested in works. MANAGEMENT.—Prest., H. W. Heneker; Supt., A. Sangster. Rept. by Secy. and Treas., E. F. Waterhouse, Nov. 10, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Nov. 26, '81.

29. **SOREL,** Richelieu Co. (6,669.) Built in '72-3 by town. SUPPLY.—Richelieu River, pumping direct. PUMPS.—(In '89.) Cap., 4,800,000 galls.; 1,000,000-Worthington. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains (in '88), 12 miles. Taps (in '90), 1,230. Hydrants (in '90), 48. CONSUMPTION.—(Galls.) av. (in '90), 300,000. PRESSURE.—(In '89.) Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—(In '90.) Cost, $80,000. Bonded debt, $40,000, at 6%. Expenses, $5,208: Operating, $2,808; int., $2,400. Revenue, $7,649. MANAGEMENT.—Supt., M. C. Blais. Above identical with matter published in '90-1 Manual. M. C. Blais, Supt., reports "no change worth noting since last rept." REFERENCE.—Eng. News, Apr. 7, '83.

11 Vt. **STANSTEAD**, Stanstead Co. (600.) Built in '93 by H. S. Haskell. Consolidated with Derby Line, Vt., and Rock Island, Que., plants, under name of International Water-Works. See Derby Line, p. 25, for supply, reservoirs, distribution and cost. FRANCHISE.—20 yrs. from '93. MANAGEMENT.—Rept. by Owner, June 19, '96. SEWERS.—None.

P 2. **SWEETSBURG**, Missisquoi Co. (303.) Aug. 11, '96, J. W. M. Wallace, Engr., rept. Stadacona Water, Light & Power Co. had secured franchises and begun to build works to supply this place and Cowansville (see the latter). Supply, lake, by gravity. Prest., J. O. C. Mignault; Mgr., L. H. Tache.

30. **THREE RIVERS**, Saint Maurice Co. (8,334.) Built in '75 by city. SUPPLY.—St. Maurice River, pumping direct. PUMPS.—Cap., 3,600,000 (?) galls.; a 2,400,000 and "two small pumps, 1,200,000" (each or combined?). Old Sidney coal used; av. cost, $3.25 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Taps, 1,900; made by city. Services, iron and lead; paid for by city as far as house. Meters: 26; owned and repairs paid by consumer; controlled by city. Use of meters optional with city; compulsory for manufacturers. Hydrants, public, 60; private, 5. CONSUMPTION.—(Galls.) av., 840,000; max., 960,000; min., 660,000. PRESSURE.—Ordinary, 70 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $155,000. Bonded debt, $97,667, at 6%. Expenses: Operating, $6,247; int., $5,860. Revenue: Consumers, $16,174. MANAGEMENT.—Water Comrs.; Prest., L. E. Dufresne; Supt., O. Z. Hamel. Rept. by Secy. and Treas., L. T. Desaulniers, Sept. 29, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Mar. 11, '82.

31. **VALLEYFIELD**, Beauharnois Co. (5,516.) Bought by city in '87; built in '86 by Valleyfield Water-Works Co. SUPPLY.—St. Lawrence River, pumping direct. PUMPS.—Cap., 450,000 (?) galls.; Blake dup. water-power, driven by two 33-in. turbines. A 1,800,000-gall. dup. power pump was to be added at once (in '96). FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, about 8 miles; cost extensions met by special by-laws. Taps, made by city. Meters, controlled and repaired by city. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 360,000; max., 480,000; min., 240,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. One steam fire engine is used. FINANCIAL.—Cost, $85,000. MANAGEMENT.—Rept. by J. Emile Vanier, Sept. 25, '96.

—? **VAUDREUIL**, Vaudreuil Co. (427.) E. L. de la Vallee & Son, Mont., rept. they were Contrs. for works built here.

D 2. **WARDEN**, Shefford Co. (250.) Built in '94 by J. A. McLaughlin; put in operation Nov. 17. SUPPLY.—Large spring, by gravity. RESERVOIR.—20 × 30 ft., × 5 ft. deep, walled with stone. DISTRIBUTION.—Mains, ½ mile. Taps, 15. Services, lead; paid for by consumer. Hydrants, private, 2. PRESSURE.—Ordinary, 50 lbs. Water is used mostly by owner of works, who runs an 18-in. water motor driving one 8-light dynamo for house, and supplies 10 consumers at $10 per yr. each. Rept. by owner.

21. **WESTMOUNT**, Hochelaga Co. (Not given.) See Montreal Water & Power Co., under Montreal.

ONTARIO.

1. **ALEXANDRIA**, Glengary Co. (1,614.) Built in '95 by city; put in operation Dec. 1. Engr., Alexander Potter, New York City. Contrs., Garson & Co., Montreal. SUPPLY.—River de Lisle, one mile north of village, pumping to stand-pipe. PUMP.—Cap., 360,000 galls.; Northey. Wood used at present; coal is to be used soon. RESERVOIR.—Cap., 3,600,000 galls.; impounding, at pumping station. STAND-PIPE.—Cap., 115,000 galls.; steel, 14 × 100 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 2½ miles; cost extensions met by annual taxes. Taps, 3; made by city. Services, iron; paid for by city. Meters, 0. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 24,000. Water is principally used by Ry. Co. FINANCIAL.—Cost, $23,000. MANAGEMENT.—Rept. by Alex. L. Smith, July 22, '96. SEWERS.—None.

2. **ALLISTON**, Simcoe Co. (1,371.) Built in or since '92. SUPPLY.—Pumped to stand-pipe. No response to inquiries.

3. **AMHERSTBURG**, Essex Co. (2,279.) Built in '91 by town. SUPPLY.—Detroit River, pumping to tank. PUMP.—Cap., 1,150,000 galls.; Kerr comp. dup. Bituminous lump coal used; av. cost, $3 per short ton. TANK.—Cap., 60,000 galls.; iron, 38 × 70 ft., on stone and brick tower; located at pumping station. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 4 miles. Taps, 500; made by town. Services, galv. i.; paid for by property owner. Meters, 10; owned by consumer; controlled by town. Use of meters optional with consumer; compulsory for those outside of town limits. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 240,000; max., 420,000; min., 120,000. PRESSURE.—Ordinary, 30 lbs.; fire, 70 to 100 lbs. FINANCIAL.—Cost, $35,000. Expenses: Operating, $2,000. All expenses are met by receipts. MANAGEMENT.—Town Treas., W. S. Folls. Rept. by Supt. and Ch. Pump. Engr., W. Middleditch, Nov. 7, '96. SEWERS.—Has partial system of sewers.

4. **AYLMER,** Elgin Co. (2,167.) Domestic supply introduced in '91 by town. Works for fire protection built in '84 by town. SUPPLY.—Catfish Creek, pumping direct. PUMPS.—Cap., 2,400,000 galls.; 600,000 Worthington high pressure and 1,800,000 Northey comp. Wood mostly used for fuel. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—Mains, 4 miles; cost extensions met by general rate of taxation. Taps, 100; made by city. Services, iron; paid for by consumer. Hydrants, public, 24. CONSUMPTION.—Unknown. PRESSURE.—Ordinary, 50 lbs.; fire 100 to 140 lbs. FINANCIAL.—Cost, $17,500. Bonded debt, $9,000 at 5%; due in equal annual payments during 15 yrs. Expenses: Operating, $1,700. Revenue, consumers, unmetered, $500. The whole is taxed on general ratable property. MANAGEMENT.—Chn., Dr. J. J. Kingston. Rept. by Supt. and Pump. Engr., Alex. Milne, June 16, '96. SEWERS.—Has storm sewers.

5. **BARRIE,** Simcoe Co. (5,550.) Built in '90-1 by Barrie Water-Works Co.; put in operation Jan. 15. FRANCHISE.—10 yrs. from '90. Co. is exempt from local taxes. City to pay for public service. No legal difficulties. SUPPLY.—Artesian wells, pumping to tank and direct. PUMP.—Cap., 1,800,000 galls.; two Northey, Worthington pattern, hor. comp. cond. dup. Wood used as fuel. TANK.—Cap., 180,000 galls.; 25 × 50 ft., on iron tower. FISCAL YEAR CLOSED Feb. 1, '96. DISTRIBUTION.—Mains, 7 miles. Taps, 400; made by Co. Services, galv. i.; paid for by consumer. Meters: 15; owned by consumer; controlled and repaired by Co. Use of meters optional with consumer. Hydrants, public, 65. CONSUMPTION.—(Galls.) av., 360,000; max., 420,000; min., 300,000. PRESSURE.—Ordinary, 70 lbs.; fire, 100 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Prest., E. A. Bond; Secy., F. A. Hinds, both of Watertown, N. Y.; Supt., W. J. Vallean; Ch. Pump. Engr., Jas. Keenan. SEWERS.—Has sanitary and storm sewers.

6. **BEAMSVILLE,** Lincoln and Niagara Co. (911.) Built in '95 by village; put in operation July 1. No Engr. nor Contr. SUPPLY.—Springs, on side of mountain, one mile distant, by gravity. RESERVOIR.—Cap., 720,000 galls.; storage, near springs, 180 ft. above main street. DISTRIBUTION.—Mains, 2 miles; cost extensions met by village. Taps, 60; made by village, free. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 14. CONSUMPTION.—Unknown. FINANCIAL.—Cost, $14,000. Bonded debt, $13,000, at 5%; due in 30 installments. Revenue: Consumers, $230. Bond rate of $846 is levied every year to pay int. and in 20 yrs. to pay off principal. MANAGEMENT.—Rept. by R. Van Noxman, Oct. 28, '96. SEWERS.—None.

7. **BEETON,** Simcoe Co. (771.) Built in '92 by city; put in operation in Jan. Engr., John Galt, Toronto. Contrs., McQuillan & Co., Toronto. SUPPLY.—Springs, by gravity from storage reservoir. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 4 miles. Taps, 150. Services, galv. i.; paid for by property owner. Meters, none. City can compel use of meters and any consumer may have one. Hydrants, public, 20. CONSUMPTION.—(Galls.) av., 12,000. PRESSURE.—Ordinary, 87 lbs. FINANCIAL.—Cost, about $20,000. Expenses: Operating, about $100. Revenue: Consumers, about $1,000. Grand Trunk Ry. pays $525 per yr. for water. MANAGEMENT.—Rept. by G. T. Somers, Aug. 10, '96. SEWERS.—None.

8. **BELLEVILLE,** Hastings Co. (9,914.) Now owned by Belleville Water-Works Co.; built in '87 by Moffett, Hodgkins & Clarke, Syracuse, N. Y. FRANCHISE—Perpetual. Co. is not exempt from local taxes. City to pay $7,000 per yr. for fire protection for 10 yrs. No legal difficulties. SUPPLY.—Bay of Quinte, an arm of Lake Ontario, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; Worthington. Run of mine bituminous coal used; av. cost, $3.45 per short ton. STAND-PIPE.—Cap., 440,000 galls.; iron, 25 × 120 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 17 miles; cost extensions met by Co., city paying 10%. Taps, 650; made by contr.; fee of $1.50 for inspection and supervision. Services, galv. i.; paid for by consumer. Meters: 30; owned partly by consumers; controlled by Co.; repairs paid by consumers. Co. can compel use of meters and any consumer may have one; compulsory for hotels and factories. Hydrants, public, 175; private, 10. CONSUMPTION.—(Galls.) max. (in summer), 1,500,000; min. (in winter), 960,000. PRESSURE.—Ordinary, 75 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $200,000. Bonded debt, $140,000, at 6%; "just running off." MANAGEMENT.—Prest., J. V. Clarke; Ch. Pump. Engr., J. Waterston. Rept. by Supt., M. M. Thompson, June 6, '96. PROJECTED IMPROVEMENTS.—Electric pumps. SEWERS.—Has partial sanitary sewers.

9. **BERLIN,** Waterloo Co. (7,425.) Built in '88 by Moffett, Hodgkins & Clarke, Syracuse, N. Y. Supplies Waterloo. FRANCHISE.—10 yrs. from '88. Rates are fixed by original contract. Co. is exempt from local taxes on account of furnishing water free for street sprinkling. City to pay $45 a hydrant a yr. No legal difficulties. SUPPLY.—Natural springs, and two artesian wells, pumping to stand-pipe and direct. PUMPS.—Cap., 1,200,000 galls.; two Worthington comp. Bituminous run of mine coal used; av. cost, $3.50 per short ton. STAND-PIPE.—Cap., 156,000 galls.; iron, 16 × 104 ft., on 94-ft. elevation. FISCAL YEAR CLOSED Oct. 18. DISTRIBUTION.—Mains, 10 miles. Taps, 685; made by plumber, no fee to Co. Services, galv. i.; paid for by consumer. Meters, 112; owned partly by Co.; partly by consumer; controlled and repaired by Co. Co. can compel use of meters and any consumer may have one; compulsory for hotels and factories. Hydrants, public, 95; private, 8. CONSUMPTION.—(Galls.) max., 900,000; min., 450,000. PRESSURE.—Ordinary, 67 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $135,000. Expenses: Operating, $4,000; taxes, none. MANAGEMENT.—Prest., J. V.

Clarke, New York City; Secy. and Treas., H. C. Hodgkins; Ch. Pump. Engr., J. A. Simpson. Rept. by Supt. J. E. Skidmore, June 9, '96. SEWERS.—Has sanitary and storm sewers.

10. **BRACEBRIDGE,** Ontario Co. (1,419.) Built in '94 by town; put in operation in Dec. Engr., W. C. Brough, Toronto. Contrs., Wm. Kennedy & Sons, Owen Sound. SUPPLY.—Spring, ¾ mile distant, by gravity to reservoir and pumping direct from Muskoka River for fire purposes, if storage supply is short. PUMP.—Cap., 1,200,000 galls.; Northey dup. water power, run by 70-HP. turbine. RESERVOIR.—Storage, 40 × 69 ft., × 12 ft. deep; near pumping station. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, about 2½ miles; cost extensions met by bonds. Taps, 100; made by town free. Services, galv. i.; paid for by town to street line. Meters, 0. Hydrants, public, 21; private, 1. CONSUMPTION.—(Galls.) av., 30,000; max., 36,000; min., 24,000. PRESSURE.—Ordinary, 60 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $20,000; some $5,000 or $6,000 to spend for extensions. Bonded debt, $26,000 at 5%; payable yearly. MANAGEMENT.—Ch. Pump. Engr., W. C. Simmons. Rept. by Supt. Alfred Hunt, Oct. 29, '96. SEWERS.—None.

11. **BRAMPTON,** Peel Co. (3,252.) Built in '81-2 by town. SUPPLY.—Snell's Lake, by gravity. Lake has area of about 40 acres; drainage area, 700 acres; 4½ miles from, 120 ft. above town. Supply main, 12-in. DISTRIBUTION.—Taps, made by town. Services, lead; paid for by town to fence line. Town can compel use of meters and any consumer may have one. PRESSURE.—Ordinary, 50 lbs. MANAGEMENT.—Rept. by Town Clk., T. J. Blair, June, '96. SEWERS.—None. REFERENCE.—Eng. News, Dec, 28, '82.

12. **BRANTFORD,** Brant Co. (12,753.) Bought by city in '88 and extended for general supply; built in '69-70 by Brantford Water-Works Co., chiefly for fire protection. SUPPLY.—Springs, pumping from collecting galleries to storage reservoir and direct. PUMPS.—Cap., 4,800,000 galls.; 2,000,000 Holly-Gaskill hor. high-duty, and 2,000,000 and 750,000 Worthington comp. cond. Reynoldsville lump and nut coal used; av. cost, $3.40 per short ton delivered. FILTERS.—Collecting galleries with natural filter of gravel. RESERVOIR.—Cap., 96,000 galls. FISCAL YEAR CLOSED Dec. 31, '96. DISTRIBUTION.—Mains, 22½ miles; cost extensions met by surplus earnings at present; in future by bonds. Taps, 1,884; made by city. Services, lead; paid for by consumer on his own property, balance paid by city. Meters, 58; owned, controlled and repaired by city; yearly rental, 15% of cost. City can compel use of meters and any consumer may have one; compulsory for factories, breweries, hotels, Rys., livery stables and bottling cellars. Hydrants, public, 177; private, 11. CONSUMPTION.—(Galls.) av., 924,739; max., 1,596,000; min., 709,555. PRESSURE.—Ordinary, 70 to 80 lbs.; fire, 110 to 120 lbs. FINANCIAL.—Cost, $237,598. Bonded debt, $215,000 at 4%. Expenses, $19,831: Operating, $7,601; int., $12,230; taxes, none. Revenue, $25,263: Consumers, $14,465; City, fire protection, $7,360; street sprinkling, $1,552; sewer flushing, $1,122; public buildings, $64; misc., $700. No deficits. MANAGEMENT.—Chn., Alfred Watts; Treas., Arthur K. Bunnell; Supt., Stephen Tomlinson; Ch. Pump. Engr., David Webster. Rept. by Secy., Wm. Frank, July 15, and Aug. 4, '96. SEWERS.—Has sanitary sewers only. REFERENCE.—Eng. News, Oct. 14, '82.

13. **BROCKVILLE,** Brockville Co. (8,793.) Bought by city in '92; built in '81-4 by Brockville Water Co. Press rept. states arbitrators awarded Co. $139,454 for property, not including stock on hand. SUPPLY.—St. Lawrence River, through 16-in. intake pipe, leading to pump well, thence pumping direct. PUMPS.—Cap., 3,000,000 galls.; two 1,500,000 Holly-Gaskill horizontal high-duty. Bituminous coal used; av. cost, $3.50 per short ton. FISCAL YEAR CLOSED Oct. 31, '95. DISTRIBUTION.—Mains, 14 miles; cost extensions met by revenue. Taps, 1,200; made by city, free. Services, lead; paid for by city. Meters: 6; owned, controlled and repaired by city. City can compel use of meters and any consumer may have one; compulsory chiefly for manufacturers. Hydrants, public, 93; private, 3. CONSUMPTION.—(Galls.) av., 1,080,000; max., 1,440,000; min., 900,000. PRESSURE.—Ordinary, 70 lbs.; fire, 90 to 100 lbs. FINANCIAL.—Cost, $180,000. Bonded debt, $150,000, at 4%. Sinking Fund: $9,000, deposited in bank. Expenses, $15,262: Operating, $8,457; int., $6,715. Revenue, $21,626: Consumers, unmetered, $17,126; City, $4,500. Revenue has thus far covered all expenses. MANAGEMENT.—Comrs. Mayor, Dr. V. E. Moore; Treas. and Supt., Robt. Picken; Ch. Pump. Engr., A. H. Franklin. PROJECTED IMPROVEMENTS.—New well, new pump and possibly repairs to intake. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, May 31, '84.

F 1. **CALEDONIA,** Haldimand Co. (968.) Fire protection plant built by Grand Trunk Ry. Supply, Grand River, pumping to elevated tank. Hydrants, 6. Address, Agt., G. T. Ry., or M. Howard, P. M.

F 2. **CAMPBELLFORD,** Northumberland. (2,424.) Built in '89-90 by village for fire protection. Supply, Trent River, pumping direct. Worthington pump. Cost and debt, each about $19,000; int., 5%.

14. **CHATHAM,** Kent Co. (9,052.) Purchased by city Aug. 1, '95; built in '89-91 by Chatham Water-Works Co. Press repts. state Co. and city agreed on $145,000 as price for property. SUPPLY.—River Thames, pumping to stand-pipe and direct. PUMPS.—Cap., 3,500,000 galls.; 3,000,000 and 500,000 Gordon. Massillon bituminous coal used;

av. cost, $3.45 per short ton. FILTERS.—Cap., 1,500,000 galls.; 3—500,000 New York. RESERVOIR.—Cap., 10,200,000 galls.; settling basin (under construction). STAND-PIPE.—Cap., 246,000 galls.; iron; 20 × 105 ft. FISCAL YEAR CLOSED Nov. 30, '95. DISTRIBUTION.—Mains, 14¾ miles; cost extensions met by sale of city debentures. Taps, 654; made by city, no fee. Services, galv. i.; paid for by city to street line. Meters: 64; owned and repaired by consumer; controlled by city. Use of meters optional with city. Hydrants, public, 166; private, 1. CONSUMPTION.—(Galls.) av., 400,000. PRESSURE.—Ordinary, 40 lbs.; fire, 90 lbs. One steam fire engine kept in reserve. FINANCIAL.—(In '90.) Cost, est., $200,000. MANAGEMENT.—Chn., Manson Campbell; Supt., Ed. B. Jones; Ch. Pump. Engr., Jas. Moore. Rept. by Secy., Jas. C. Weir, Aug. 17, '96. SEWERS.—Has sanitary and storm sewers.

15. **COBOURG,** Northumberland Co. (4,829.) Built in '88-9 by Cobourg Water-Works Co. SUPPLY.—Lake Ontario, pumping to stand-pipe and direct. PUMP.—Cap., 2,000,000 galls.; 2—1,000,000 Worthington comp., a cond. and a non-cond. Anthracite screenings and slack used; av. cost, $3.20 per short ton. STAND-PIPE.—Cap., 174,000 galls.; steel; 16 × 116 ft. FISCAL YEAR CLOSED July 1, '96. DISTRIBUTION.—Mains, 6 miles. Taps, 160; made by Co. for $1.50. Services, galv. i.; paid for by consumer. Meters: 50; owned, controlled and repaired by Co. Use of meters compulsory for hotels, liveries, factories. Co. can compel use of meters and any consumer may have one. Hydrants, public, 72; private, 4. CONSUMPTION.—(Galls.) av., 200,000; max., 280,000; min., 150,000. PRESSURE.—Ordinary, 55 lbs.; fire, 70 lbs. FINANCIAL.—Cap. Stock: Authorized, $100,000. Bonded debt, $60,000, at 6%. Expenses, $7,339: Operating, $4,059; int., $3,044; taxes, $236. Revenue, $7,049: Consumers, unmetered, $1,495; metered, $1,117; City, fire protection, $3,190; other purposes, $1,247. MANAGEMENT.—Prest., J. F. Moffett; Mgr., F. B. Roblin; Secy. and Treas., C. T. Moffett; all of N. Y. City; Supt., A. J. Hewson; Ch. Pump. Engr., I. Crozier. Rept. by Mgr. and Supt. SEWERS.—Has partial system of sanitary and storm sewers.

16. **COLLINGWOOD,** Simcoe Co. (4,940.) Built in '90 by city. Engr., John Galt. Contrs., Lindsay & Burdette. SUPPLY.—Georgian Bay, pumping direct. PUMPS.—Cap., 3,000,000 galls.; 2—1,500,000 comp. dup. Hard wood used; av. cost, $2.75 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 13¾ miles; cost extensions met by debentures. Taps, 884; made by city, free. Services, lead and galv. i.; paid for by city to property line. Meters, 0. Hydrants, public, 63; private, 3. CONSUMPTION.—(Galls.) av., 343,000; max., 702,000; min., 193,000. PRESSURE.—Ordinary, 40 lbs.; fire, 100 lbs. Steam fire engines seldom used. FINANCIAL.—Cost, $79,000. MANAGEMENT.—Chn., Jas. G. Collingwood; Town Clerk, Jno. Hogg; Town Treas., A. D. Knight; Ch. Pump. Engr., Jno. Smith. Rept. by Supt., Thos. Bassett, Aug. 19, '96. PROJECTED IMPROVEMENTS.—Filtering basin.

17. **CORNWALL,** Cornwall and Stormont Co. (6,805.) Built in '86 by Cornwall Water Co. In March, '97, appraisers were taking testimony regarding the price the city should pay for the plant, it intending to buy the works. SUPPLY.—St. Lawrence River, pumping to stand-pipe. PUMPS.—Cap., 3,000,000 galls.; Worthington. STAND-PIPE.—Cap., 230,000 galls.; iron. DISTRIBUTION.—Mains, 9 miles. Taps, 400. Meters, 7. Hydrants, 64. CONSUMPTION.—(Galls.) av., 480,000. PRESSURE.—(In '89.) Ordinary, 63 lbs.; fire, 150 lbs. FINANCIAL.—Cost, $125,000. Bonded debt, $80,000 at 6%. Expenses, $7,300: Operating, $2,500; int., $4,800. Revenue, $8,200: Consumers, $6,000; City, fire protection, $2,200. MANAGEMENT.—Secy., A. W. Flack. Rept. by Prest. and Supt., D. A. Flack, Oct. 30, '96.

18. **DESERONTO,** Hastings Co. (3,338.) Built in '96 by city. Engr., M. J. Butler. Contr., John Hartnett, Toronto. SUPPLY.—Bay of Quinte, pumping to tank and direct; filtered. PUMP.—Northey comp. cond. dup. underwriter. Bituminous coal used; av. cost, $3.75 per short ton; wood and mill refuse mostly used. FILTERS.—Cap., 600,000 galls.; Jewell, pressure. TANK.—Cap., 70,000 galls.; 19 × 35 ft., on 60-ft. steel trestle. DISTRIBUTION.—Mains, 3 miles; cost extensions met by debentures. Taps, 100; made by city, no fee. Services, galv. i.; paid for by city to property line. Hydrants, public, 48. CONSUMPTION.—(Galls.) av., 840,000; max., 1,800,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $35,000. Bonded debt, $35,000 at 4%, paid in 30 ann. instalments of $206. Sinking Fund, none. Revenue, $1,500. Deficits, are met by general tax. MANAGEMENT.—Mayor, E. W. Rathbun; Town Clerk, Robt. Irvine; Treas., F. S. Rathbun. Rept. by Supt., M. J. Butler, Nov. 2, '96. SEWERS.—Has storm sewers and dry earth system for household wastes.

19. **DUNDAS,** Wentworth Co. (3,546.) Built in '83 by town. SUPPLY.—Springs, by gravity from receiving reservoir 500 ft. above town. RESERVOIR.—Cap., 1,500,000 galls. DISTRIBUTION.—Mains; cost extension met by debentures. Taps, 100; made by city. Services paid for by owner. Meters, 0. Use of meters optional with city. Hydrants, public, 43. CONSUMPTION.—(Galls.) av., 40,000. PRESSURE.—Ordinary, 85 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $60,000. Sinking Fund is provided. Deficits met by general fund. MANAGEMENT.—Chn., H. Bertram; Supt., E. F. Twin. Rept. by Secy., Jas. More, July 17, '96. SEWERS.—None.

20. **DUNNVILLE,** Monck Co. (1,776.) Built in '91 by town; put in operation in Dec. Engr., Jno. Galt, Toronto. Contr., Miles Hunting, Hamilton. SUPPLY.—Grand River, pumping to reservoir and direct. PUMP.—Cap., 1,300,000 galls.; comp. dup. Natural

gas used; cost, $250 per yr. RESERVOIR.—Cap., 50,000 galls.; on G. T. Ry. Works. FISCAL YEAR CLOSED June 1, '96. DISTRIBUTION.—Mains, 3 miles; cost extensions met by general fund. Taps, 100; made by town. Services, iron; paid for by town to property line. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 27. PRESSURE.—Ordinary, 40 lbs.; fire, 80 lbs. FINANCIAL.—Bonded debt, $4,958 at 6%. Expenses, $1,523: Operating, $1,000; bonds and int., $523. Revenue, Consumers, $1,000. MANAGEMENT.—Ch. Pump. Engr., Jno. Riddle. Rept. by Supt., J. W. Holmes, June 15, '96. PROJECTED IMPROVEMENTS.—Filtering of supply under consideration. SEWERS.—Has partial system of sanitary sewers.

21. **ESSEX,** Essex Co. (1,709.) Built in '91 by town. Engr., Jno. Galt, Toronto. Contrs., Garson & Purser, St. Catharines. SUPPLY.—Three 8-in. artesian wells, pumping to collecting reservoir and repumping to elevated tank and direct. PUMPS.—Two 8-in. deep-well and one high-pressure dup. Bituminous lump coal used; av. cost, $3.50 per short ton. TANK.—Cap., 36,000 galls.; steel, 16 × 24 ft., on 50-ft. stone and brick tower. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4 miles; cost extensions met by special assessment on lots passed. Taps, 225; made by contractor for $7 on short and $10 on long side of street, including service to curb box. Services, galv. i.; paid for by consumer. Meters, 0. Use of meters optional with city. Hydrants, public, 36; private, 1. CONSUMPTION.—(Galls.) av., 84,000; max., 120,000; min., 48,000. PRESSURE.—Ordinary, 20 lbs.; fire, 60 lbs. FINANCIAL.—Cost, $31,000. Debt, $23,000: Floating, $3,000; Bonded, $20,000. Sinking Fund, none. Expenses: Operating, $1,400. Revenue, $1,132. Town issued 30-yr. debentures for construction, repayable $1,728 yearly. Deficits met by general taxation. MANAGEMENT.—Ch. Pump. Engr., A. Waddington. Rept. by Geo. J. Thomas, Feb. 12, '97. PROJECTED IMPROVEMENTS.—New boiler, well and well pump. SEWERS.—Has storm sewers.

22. **GALT,** Waterloo Co. (7,535.) Built in '90-1 by city; put in operation Dec. 1. SUPPLY.—Springs and artesian well, by gravity to collecting reservoir, thence pumping to stand-pipe. PUMP.—Cap., 1,800,000 galls.; Goldie & McCulloch cross-comp. cond. dup. Bituminous run of mine coal used. RESERVOIR.—Cap., 150,000 galls. STAND-PIPE.—Cap., 275,000 galls.; iron, 30 × 52 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 18 miles; cost extensions met by city. Taps, 1,000; made by city. Services, lead; paid for by city to street line. Meters: 30; owned, controlled and repaired by city; yearly rental, $3. Use of meters compulsory for services paying more than $5 per yr. City can compel use of meter and any consumer may have one. Hydrants, public, 117; private, 3. CONSUMPTION.—(Galls.) av., 450,000; max., 660,000; min., 378,000. PRESSURE.—Ordinary and fire, 60 to 100 lbs. FINANCIAL.—Cost, $157,000. Bonded debt, $150,000, at 4 to 5%. Sinking Fund: $12,058, invested at 4%. Expenses: Operating, $3,206. Revenue: Consumers, $6,126. Bonded debt paid by general taxation. MANAGEMENT.—Water Comrs.; Chn., A. McAuslan; Treas., J. M. Hood; Ch. Pump. Engr., P. Cowan. Rept. by Supt., A. J. McPherson, June 9, '96. PROJECTED IMPROVEMENTS.—New artesian well and extensions, under construction. SEWERS.—None.

23. **GANANOQUE,** Leeds Co. 3,669.) Built in '91-2 by city. Engr., Willis Chipman, Toronto. Contrs., Garson & Purser. Town previously had small fire protection plant. SUPPLY.—Gananoque River, pumping direct. PUMPS.—Cap., 1,200,000 galls.; water-power, from Engine & Machine Co., Toronto. DISTRIBUTION.—Mains, 2 miles. Services, galv. i. Hydrants, public, 24. PRESSURE.—Fire, 120 lbs. FINANCIAL.—Cost, $20,000. MANAGEMENT.—Rept. by Willis Chipman, March 12, '96. SEWERS.—None.

24. **GEORGETOWN,** Halton Co. (1,509.) Built in '91 by town; put in operation Dec. 1, '91. Engr., James Warren. Contrs., Garson & Purser, St. Catherines. SUPPLY.—Springs, by gravity from reservoir. RESERVOIR.—Cap., 500,000 galls.; impounding, 3 miles from town. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 6 miles; cost extensions met by taxation. Taps, 200; made by town. Services, lead or iron; paid for by consumer or owner. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 220,000. PRESSURE.—Ordinary, 90 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $40,000. Bonded debt, $40,000, at 5%; due in 25 yrs. Sinking Fund, none. Expenses: Operating, $100; taxes, $100. Revenue: Consumers, $1,800. Deficits are met by taxation. MANAGEMENT.—Prest. and Supt., Joseph Barber. Rept. by Secy., G. S. Goodwillie, Sept. 1, '96. SEWERS.—None.

25. **GODERICH,** Huron Co. (3,839.) Built in '88 by city. SUPPLY.—Artesian wells and Lake Huron in case of emergency, pumping direct. PUMP.—Cap., 3,000,000 galls.; Gordon comp. dup. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 14 miles; cost extensions met by direct tax. Taps, 425; made by town. Hydrants, public, 54; private, 2. CONSUMPTION.—(Galls.) av., 324,000; max., 672,000. PRESSURE.—Ordinary, 100 lbs.; fire, 170 lbs. FINANCIAL.—Cost, $68,000. Sinking Fund: $5,690, invested in mortgages at 5½ and 6%. Expenses: Operating, $4,000. Revenue: Consumers, $3,400. MANAGEMENT.—Supt. and Ch. Pump. Engr., W. H. Smith. Rept. by Supt., June 10, '96. PROJECTED IMPROVEMENTS.—1,500 ft. of 14-in. intake in lake and stand-pipe. SEWERS.—Has storm sewers.

26. **GUELPH,** Wellington Co. (10,539.) Built in '79-80 by city. SUPPLY.—

Springs and surface water, with river connection for emergency, pumping direct from reservoirs. Two infiltration basins are in use. PUMPS.—(In '89.) Cap., 1,800,000 galls.; two pairs, 7¼ × 22 ins., made by Blaikie & McKay, Sarnia. A 1,800,000 Walker is also reported. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 18 miles; cost extensions met by appropriations and debentures. Taps, 520; made by city, no fee. Services, lead; paid for by consumer. Meters, 6; owned, controlled and repaired by city. Use of meters optional with city. Hydrants, 120. CONSUMPTION.—(Galls.) av., 600,000; max., 1,000,000; min., 360,000. PRESSURE.—Ordinary, 90 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $150,000. Expenses: Operating, $5,000. Revenue, $13,000. MANAGEMENT.—Chn., R. E. Nelson; Supt. and Ch. Pump. Engr., Jas. Fordyce. SEWERS.—None. REFERENCE.—Eng. News, Jan. 20, '83.

27. **HAMILTON,** Wentworth Co. (48,980.) Built in '56-9 by city. SUPPLY.—Lake Ontario, pumping direct and to reservoir from filter basin, and repumping for high service. PUMPS.—Cap., 15,600,000 galls.; two Simpson comp. cond., vertical beam and fly-wheel; Osborne, Kelly & Co. hor. comp. cond.; 1,800,000 Worthington. Anthracite and bituminous slack used. FILTER BASIN.—In sand bar between Lake and Burlington Bay; area, 1½ acres. RESERVOIRS.—Cap., 13,740,000 galls. Low service: Cap, 13,200,000, on mountain side, midway between pumps and city, 185 ft. above lake. High service: 540,000. DISTRIBUTION.—Mains; cost extensions met by general revenue. Taps, 14,000; made by city, free. Services, lead; paid for by city. Meters: 29; owned, controlled and repaired by city. Use of meters optional with city; compulsory for factories and R. Rs. Hydrants, public, 739. CONSUMPTION.—(Galls.) av., 6,600,000; max., 9,600,000. PRESSURE.—Ordinary, 40 lbs. Steam fire engines are used. FINANCIAL.—Cost, $1,500,000. Expenses: Operating, $35,000. Revenue: Street sprinkling, $14,000. MANAGEMENT.—Chn., Jas. Dixon; Secy., W. A. Kerr; Treas., A. Stuart; Ch. Pump. Engr., Jas. Macfarlane. Rept. by Wm. Haskins, June 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Sept. 17, '81.

P 1. **HUNTSVILLE,** Muskoka and Parry Sound Dist. (1,159.) Nov. 21, '97. citizen rept. it was expected works would be completed by June, '97. Engr., V. M. Roberts, St. Catharines. Press rept. about same time stated contract had been let to E. Farquhar, Toronto.

28. **INGERSOLL,** Oxford Co. (4,191.) Built in '90 by Ingersoll Water-Works Co. FRANCHISE.—50 yrs. from '91. Rates are fixed in franchise. Co. is exempt from local taxes. City to pay $40 per hydrant per yr. SUPPLY.—Springs by gravity to pump well, thence pumping to stand-pipe and direct. PUMPS.—Cap., 2,225,000 galls.; 1,500,000 Deane comp. dup. and 750,000 water-power dup. Bituminous lump coal used; av. cost, $3.65 per short ton delivered. STAND-PIPE.—Cap., 165,000 galls.; steel, 16 × 110 ft., on highest ground in city. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 7 miles; cost extensions met by revenue. Taps, 280; made by plumbers, 50 cts. charged for use of tapping machine. Service, galv. i.; paid for by consumer. Meters, 80; owned, controlled and repaired by Co.; yearly rental $2.50. Use of meters compulsory for factories, barber shops and any service where consumption cannot be estimated. Co. can compel use of meters and any consumer may have one. Hydrants, public, 60; private, 2. CONSUMPTION.—(Galls.) av., 132,000; max., 144,000. PRESSURE.—Ordinary, 60 lbs.; fire, 100 lbs. Steam fire engines used only in exceptional cases. FINANCIAL.—Cost, $100,000. Bonded debt, $60,000 at 6%. Revenue, $5,400; City, fire protection, $2,600; other purposes, $2,800. MANAGEMENT.—Prest., J. F. Moffett, N. Y. City. Rept. by Supt., Geo. Duncan. SEWERS.—None.

29. **IROQUOIS,** Dundas Co. (1,047.) Built in '85-6 by Buchanan & Serviss. SUPPLY.—St. Lawrence River, pumping direct. DISTRIBUTION.—Mains, 1.5 miles. Taps, 75. Hydrants, 15. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire 75 lbs. FINANCIAL.—Cost, $18,000. Cap. Stock, $18,000. No debt. Expenses, $450. Revenue, $1,650. NOTE.—No rept. since '90-1 Manual.

30. **KINCARDINE,** Bruce Co. (2,631.) Bought by city July, '94; built in '90 by Moffett, Hodgkins & Clarke. SUPPLY.—Lake Huron, pumping to stand-pipe and direct. PUMP.—Cap., 1,500,000 galls.; Worthington comp, dup. Bituminous coal screenings used; av. cost, $2.37 per short ton. STAND-PIPE.—Cap., 150,000 galls.; steel, 16 × 100 ft. DISTRIBUTION.—Mains, 3¾ miles. Taps made by city. Services, galv. i.; paid for by city to street line. Meters, 8; owned by city; yearly rental, $3. Use of meters compulsory for steam users. City can compel use of meter and any consumer may have one. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 120,000. PRESSURE.—Ordinary, 60 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $45,000. MANAGEMENT.—Chn., A. Malcom; Secy., F. R. Collins. Rept. by Ch. Pump. Engr., Jos. H. Walker, June 11, '96. SEWERS.—None.

31. **KINGSTON,** Frontenac Co. (19,264.) Bought by city in '87; built in '50 by Co.; new plant erected in '88-9. SUPPLY.—Lake Ontario, pumping to stand-pipe. PUMPS.—Cap., 10,200,000 galls.: 3,600,000 Osborn Killey; 1,800,000 Blake dup.; 4,800,000 Inglis. Last named was under construction at time of rept. and press rept. in Mar., '97, stated it had been completed. Bituminous screenings used; av. cost, $2 per short ton. STAND-PIPE.—Cap., 750,000 galls.; steel, 40 × 80 ft., 107 ft. above Lake Ontario. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains: Cost extensions met by debentures. Taps, 2,530; made by city. Services, lead; paid for by city.

Meters, 40; owned, controlled and repaired by city; yearly rental, $2 to $10. Use of meters compulsory for large users; optional with city. Hydrants, public, 210; private, 10. CONSUMPTION.—(Galls.) av., 1,500,000; max., 1,800,000. PRESSURE.—Ordinary, 40 to 80 lbs. Steam fire engines are seldom used. FINANCIAL.—Cost, $315,000. Bonded debt, $274,000 at 4½%; due in 30 yrs. Expenses: Operating, $8,900. Revenue, $24,000. Revenue pays all expenses. MANAGEMENT.—Chn., J. J. Behan; Secy. and Treas., F. Smith; Ch. Pump. Engr., W. Haslett. Rept. by Supt., T. Hewitt, June 12, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Nov. 11, '82.

32. **KINGSVILLE**, Essex Co. (1,335.) Built in '94 by city. Engr., Wm. Newman, Windsor. Contr., Christian Johnson. SUPPLY.—Lake Erie, pumping direct and to elevated tank. TANK.—Cap., 45,000 galls.; steel, 16 × 30 ft., on masonry tower. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 3½ miles. Taps made by consumer, fee $5. Services, galv. i.; paid for by consumer. Meters, 15; owned by consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 32. PRESSURE.—Ordinary, 52 lbs.; fire, 80 to 100 lbs. MANAGEMENT.—Rept. by Supt., Fred Foster, Oct. 28, '96.

33. **LEAMINGTON**, Essex Co. (1,910.) Built in '91 by town; put in operation Aug. 31. SUPPLY.—Artesian wells, pumping to reservoir. PUMP.—Cap., 120,000 galls.; Kerr Bros. RESERVOIR.—Cap., 48,000 galls. DISTRIBUTION.—Mains, 2.5 miles. Hydrants, 27. PRESSURE.—Ordinary, 45 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $16,000. Bonded debt, $15,000 at 5%. NOTE.—No rept. since '90-1 Manual.

34. **LINDSAY**, Victoria Co. (6,081.) First works built in '74 by town for fire protection only. Present works built in '92 by Lindsay Water-Works Co. Engr., E. C. Cooke. Contr., E. B. Calkins. FRANCHISE.—Co. is exempt from local taxes. City to pay for public service. SUPPLY.—River, pumping to stand-pipe and direct; filtered. PUMPS.—Cap., 2,450,000 galls.; 350,000 Worthington and 2,100,000 Deane comp. dup. Reynoldsville select coal used; av. cost, $4.25 per short ton. FILTERS.—Cap., 600,000 galls.; gravity. STAND-PIPE.—Cap., 165,000 galls.; 16 × 110 ft. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 7 miles. Taps, 333; made by Co. Services, iron; paid for by Co. Meters, 4; owned by Co. Co. can compel use of meters and any consumer may have one. Hydrants, public, 70. CONSUMPTION.—(Galls.) av., 360,000. PRESSURE.—Ordinary, 60 lbs.; fire, 95 lbs. FINANCIAL.—Cost, $85,000. Cap. Stock, authorized, $8,000; all paid-up. Bonded debt, $67,000 at 6%; due 1902. Sinking Fund, none. Expenses, $6,420: Operating, $2,400; int., $4,020. Revenue, $6,890: Consumers, unmetered, $2,400; metered, $200; City, fire protection, $3,290; R. R., $1,000. MANAGEMENT.—Prest., J. F. Moffett, N. Y. City; Treas., C. T. Moffett. Rept. by Supt., F. K. Beglie, July 15, '96. SEWERS.—None. REFERENCE.—Eng. News, Sept. 1, '83.

F 3, P 2. LISTOWELL, Perth Co. (2,587.) Built in '74 by town & Hess Bros. for fire protection. Supply, Scugog River, pumping direct. Worthington steam and two Holly water-power pumps, owned and operated by Hess Bros., in connection with their factory, for $500 per year. Mains, 1 mile. Hydrants, 17. Pressure, 110 lbs. Cost, about $15,000. Bonded debt, $10,000. Int., 6%. Ann. op. exp., about $1,600. No rept. since '89-90.

PROJECTED WORKS.

Latter part of '96 town voted $15,000 for electric light and water-works. Chn. W. Com., Jos. Heppler.

35. **LONDON**, Middlesex Co. (31,977.) Built in '77-8 by city. SUPPLY.—Springs, about 4 miles from city, pumping to reservoir and direct. PUMPS.—Cap., 9,200,000 galls.; 2,000,000 Worthington dup. water-power; 2,400,000 Kelly comp. cond., and 4,800,000 Blake, both steam. Bituminous coal screenings used; av. cost, $2.90 per short ton. RESERVOIRS.—Cap., 10,800,000 galls.; impounding, 3,600,000; distributing, 7,200,000. FISCAL YEAR CLOSED Nov. 30. DISTRIBUTION.—Mains, 60 miles; cost extensions met by debentures. Taps, 7,000; made by city. Services, lead; paid for by city to 20 ft. inside of street line. Meters: 150; owned, controlled and repaired by city. Use of meters compulsory for large consumers. City can compel use of meters and any consumer may have one. Hydrants, public, 372; private, 20. CONSUMPTION.—(Galls.) av., 3,600,000; max., 4,800,000; min., 3,000,000. PRESSURE.—Ordinary, 60 to 95 lbs. FINANCIAL.—Cost, $711,206. Bonded debt, $644,629: $594,629 at 4%; $50,000 at 4%; due in 30 yrs. Expenses, $48,304: Operating, $22,519; int., $25,785. Revenue, $74,248: Consumers, $61,133; City, $13,115. MANAGEMENT.—Prest., Jos. C. Judd; Secy., O. Elwood; Treas., John Pope; Ch. Pump. Engr., Alex. Findlay. Rept. by Supt., Jno. M. Moore, July 13, '96. PROJECTED IMPROVEMENTS.—Increase in water-supply. SEWERS.—Has storm and partial sanitary sewers. REFERENCES.—Eng. News, Aug. 13, '81; reservoir, June 21, '90.

F 4. LUCKNOW, Bruce Co. (1,285.) Built in '89-90 by town for fire protection. Supply, millpond, pumping to tank. Cost, about $11,000. Debt, $11,000. No rept. since '89-90 Manual.

F 5. MARKHAM, York Co. (1,100.) Built in '90-1 by village for fire protection; put in operation May 1. Supply, springs, collected in reservoir, pumping direct and

eventually to stand-pipe. Pumps, cap., 1,200,000 galls.; Inglis & Hunter dup.; steam furnished by electric plant. Mains, 1 mile. Hydrants, 15. Pressure, 100 lbs. Cost, $10,000. Bonded debt, $10,000. Rept. by Chn., M. White, Sept. 29, '96.

36. **MEAFORD,** Grey Co. (1,999.) Built in '95 by town. Engr., J. G. Sing; Contrs., McQuillan & Co. SUPPLY.—Georgian Bay, pumping to elevated tank. PUMPS.—Cap., 1,200,000 galls.; Worthington comp. dup. Wood used as fuel. FILTERS.—Circular basin, impervious to water on town side, water entering it from Bay, passes through dry stone wall 8 × 11 ft. on lake side. TANK.—Cap., 39,000 galls.; on 64-ft. octagonal brick tower. DISTRIBUTION.—Mains: Cost extensions met by frontage tax. Taps made by town. Services, iron and lead; paid for by town to street line. Hydrants, public, 35. FINANCIAL.—Bonded debt, $22,000 at 4%. Works are self-sustaining. MANAGEMENT.—Chn., T. C. Wilcox; Treas., Jas. Stuart; Ch. Pump. Engr., Wm. Rose. Rept. by Supt., J. G. Sing, Oct. 28, '96. SEWERS.—None.

37. **MERRITTON,** Lincoln and Niagara Co. (1,813.) Built in '88 by town. SUPPLY.—Lake Erie, by gravity to reservoir. RESERVOIR.—Cap., 9,600,000 galls.; settling and distributing. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4.1 miles; cost extensions met by revenue. Taps, 300; made by town. Services, lead and iron; paid for by town; consumer pays one year water rates in advance. Meters, 0. Town can compel use of meters and any consumer may have one. Hydrants, public, 48; private, 8. PRESSURE.—Ordinary, 80 lbs. FINANCIAL.—Cost, $71,000. Expenses: Operating, $700. Deficits met by general tax. Town issued for construction of works 30 yrs. debentures and pay off one each yr. MANAGEMENT.—Chn., W. L. Niles; Treas., W. V. Dicker. Rept. by Secy. and Supt., R. Clark, June 8, '96. SEWERS.—None.

38. **MILTON,** Halton Co. (1,450.) Built in '87-8 by town. SUPPLY.—Springs, by gravity, from connecting reservoir. RESERVOIR.—Cap., 500,000 galls.; 2 miles from and 200 ft. above town. DISTRIBUTION.—Mains, 3 miles. Taps, 100; made by town. Services, iron; paid for by town to street line. Meters: 3; owned and repaired by consumers; controlled by town. Town can compel use of meters and any consumer may have one. Hydrants, public, 19. CONSUMPTION.—(Galls.) av., 24,000. PRESSURE.—Ordinary, 85 to 95 lbs. FINANCIAL.—Cost, about $25,000. Expenses, Operating, $150; principal and int., $1,300. Revenue, Consumers, $1,250. Deficits met by general taxation. MANAGEMENT.—Rept. by Supt., E. F. Earl, June 8, '96. PROJECTED IMPROVEMENTS.—Extension of mains and increase of supply. SEWERS.—Has partial system of storm sewers.

F 6. **MITCHELL,** Perth Co. (2,101.) Built in '74 by town for fire protection. Supply, surface water, pumping direct. Pumps, two, of 16-in. cylinders, made by Inglis & Hunter. Mains, 6,500 ft. Hydrants, 10. Pressure, 80 to 100 lbs. Cost, $15,000. Bonded debt, $15,000 at 6%. Expenses, about $900. No rept. since '90-1 Manual. Reference.—Eng. News, May 16, '85.

39. **MORRISBURG,** Dundas Co. (1,859.) Built in '87 by town. SUPPLY.—St. Lawrence River, pumping direct. PUMPS.—Cap., 2,940,000 galls.: 500,000 triplex plunger and 1,440,000 Silsby rotary, both water-power; 1,000,000 Blake steam. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 4 miles. Taps, 25; made by town, no fee. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 23. CONSUMPTION.—(Galls.) av., 600,000; max., 720,000; min., 360,000. PRESSURE.—Ordinary, 60 lbs.; fire, 90 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $17,000 at 5%; due in 21 yearly payments. Sinking Fund, none. Expenses, Operating, $710. Revenue, $1,324. MANAGEMENT.—Ch. Pump. Engr., Cyrus Casselman. Rept. by Reeve J. O. Meikle, June 13, '96. SEWERS.—None.

40. **NAPANEE,** Lennox Co. (3,434.) Built in '90-1 by Napanee Water-Works Co. FRANCHISE.—Provides for purchase of works by city after 10 yrs., price to be determined by arbitration. Rates are fixed in franchise. SUPPLY.—Napanee River, pumping to stand-pipe and direct. PUMP.—Cap., 2,000,000 galls.; Northey, Worthington pattern. STAND-PIPE.—Cap., 150,000 galls.; 16 × 100 ft. FISCAL YEAR CLOSED Dec. 31. DISTRIBUTION.—(In '90.) Mains, 3 miles. Taps, 120. Hydrants, 33. CONSUMPTION.—(In '90.) (Galls.) av., 120,000. PRESSURE.—(In '89.) Ordinary, 45 lbs.; fire, 125 lbs. FINANCIAL.—(In '90.) Cost, $60,000. Cap. Stock: authorized, $60,000; all paid-up. Bonded debt, $40,000 at 6%; due in 1911. Expenses, $3,000: Operating, $1,000; int., $2,000. MANAGEMENT.—Prest. and Treas., E. A. Bond; Secy., F. K. Hanover; both of Watertown, N. Y. Supt., J. R. Dafoe. Rept. made Sept. 29, '96.

41. **NEWMARKET,** Ontario Co. (2,143.) Built in '86 by town. SUPPLY.—Artesian well, pumping to reservoir. PUMP.—Cap., 1,440,000 galls.; Worthington type, made by Inglis & Hunter. RESERVOIR.—Cap., 1,000,000 galls. DISTRIBUTION.—Mains, 4 miles. Taps, 113. Meters, 1. Hydrants, 25. PRESSURE.—(In '89.) Ordinary, 40 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $20,100. Bonded debt, $20,000 at 5%; payable in 30 equal annual payments. Expenses, $1,600: Operating, $600: int., $1,000. Revenue, Consumers, $1,275. NOTE.—No rept. since '90-1 Manual.

42. **NIAGARA FALLS,** Welland Co. (3,349.) Bought by town in Apr., '84, from Z. B. Lewis, for $17,000; built in '56 by Co. Improved in '90 to extent of $77,500. SUPPLY.—Niagara River, pumping direct, surplus going to reservoir. PUMPS.—Cap.,

3,600,000 galls.; two 1,800,000 Kennedy & Sons (Owen Sound); water power. RESERVOIR.—Cap., 4,800,000 galls.; to be used only in case of stoppage of pumps. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 20 miles; cost extensions met by revenue from rentals. Taps, 900; made by town, including service to within 6 ft. of property line. Services, lead and iron. Meters: 1; owned, controlled and repaired by town; yearly rental, none. Town can compel use of meters and any consumer may have one; compulsory for hydraulic lift for electric Ry. Hydrants, public, 50. PRESSURE.—Ordinary, 90 lbs.; fire, 110 to 120 lbs. One steam fire engine is owned but not used. FINANCIAL.—Cost, $96,500. Debt: Floating, none. Bonded, $75,565 at 5%. Sinking Fund, none. Expenses, $4,498: Operating, $850; extensions and new works, $1,288; salaries, $2,360. Revenue, $7,181: Consumers, unmetered, $7,083; metered, $98; City, none. Deficits are met by general taxation. MANAGEMENT.—Chn., Thos. Sills; Treas., John R. Peckham; Pump. Engrs., E. C. Carter and Robt. Little. Rept. by Secy. and Supt., Jno. Robinson, June 8, '96. PROJECTED IMPROVEMENTS.—Larger reservoir. SEWERS.—Under construction. REFERENCE.—Eng. News, Dec. 9, '82.

43. **NORTH BAY,** Nipissing Dist. (Not given.) Built in '92 by town; Engr., L. V. Rourke, Sudbury. Contrs., Garner & Purser, St. Catherines. SUPPLY.—Lake Nipissing, pumping to stand-pipe and direct. PUMP.—Cap., 48,000 galls.; water power. Wood used. STAND-PIPE.—Cap., 72,000 galls.; metal, covered with wood, 80 ft. high, on stone tower 60 ft. high. DISTRIBUTION.—Mains: Cost extensions met by town and consumers. Taps made by town. Services, galv. i.; paid for by consumer. Meters, 0. Hydrants, public, 54. CONSUMPTION.—(Galls.) av., 48,000. PRESSURE.—Ordinary, 60 lbs.; fire, 85 lbs. FINANCIAL.—Cost, $34,000. MANAGEMENT.—Rept. by Supt., I. A. Kinsella, Oct. 30, '96. SEWERS.—None.

44. **NORTH TORONTO,** York Co. (Not given.) Built in '92 by town; put in operation in June. Contrs., McQuillan & Co., Toronto. SUPPLY.—Open wells, in gravel, pumping to tank. PUMPS.—Cap., 1,200,000 galls.; Worthington type made by Smith & Co. (Toronto) comp. dup. Select bituminous lump coal used; av. cost, $3.55 per short ton; run of mine, $3.25. TANK.—Cap., 96,000 galls.; wood, 27 × 20 ft., on heavy oak trestle 60 ft. high, on elevated ground 200 ft. above center of town. FISCAL YEAR CLOSED April, '96. DISTRIBUTION.—Mains, about, 7 miles; cost extensions met by local rate against property benefited. Taps, 180; made by town for $5, which is deducted from rates charged consumer. Meters: 4; owned by consumer; controlled by town. Town can compel use of meters and any consumer may have one; compulsory for dairies, florists and brickyards. Hydrants, public, 49. CONSUMPTION.—(Galls.) av., 39,600; max., 55,200, in summer; min., 24,000, in winter. PRESSURE.—Ordinary and fire, 80 to 200 lbs. FINANCIAL.—Cost, $40,000. Works operated in conjunction with electric light plant. Expenses, Operating, $600, w.-wks. alone. Deficits are met by general taxation. MANAGEMENT.—Mayor and Council. Supt., Jas. Pears; Pump. Engrs., J. Tylor and W. Kerswell. Rept. by W. J. Douglas, June 24, '96, and Wm. Cross, Toronto, Nov. 28, '96. PROJECTED IMPROVEMENTS.—Enlarging wells, under consideration by Council. SEWERS.—None.

45. **ORANGEVILLE,** Wellington Co. (2,962.) Built in '96 by town; put in operation June 25. Engr., Willis Chipman. Contrs., Shields & Gowanlock, all of Toronto. Small works for fire protection built in '70. SUPPLY.—Springs, collected in reservoir, pumping to tank. PUMP.—Cap., 960,000 galls.; Kerr Engine Co. dup. Wood coal. RESERVOIR.—Cap., 84,000 galls. TANK.—Cap., 60,000 galls.; wood, 22 × 18 ft., on steel trestle. DISTRIBUTION.—Mains, 7½ miles. Taps, 130; made by town. Services, lead and galv. i; paid for by town to property line. Meters: 2; owned, controlled and repaired by town; yearly rental, $3. Town can compel use of meters and any consumer may have one; compulsory for hotels. Hydrants, public, 53. CONSUMPTION.—No record. PRESSURE.—Ordinary, 32 to 50 lbs.; fire, 80 to 90 lbs. FINANCIAL.—Cost, $50,000. MANAGEMENT.—Secy., A. A. Hughson; Treas., Francis Irwin. Rept. by Supt., Jas. Pickering, Jan. 11, '97. SEWERS.—Has partial storm sewers only. REFERENCE.—Eng. News, June 13, '85.

46. **ORILLIA,** Simcoe Co. (4,752.) Built in or prior to '92 by town for general supply. No response to inquiries.

47. **OTTAWA,** Carleton Co. (44,154.) Built in '74 by city. SUPPLY.—Ottawa River, above city, pumping direct. PUMPS.—Cap., 19,200,000 galls.; four sets hydraulic pumps. Additional pumps were projected at time of rept., and in Mar., '97, a 10,000,000 steam pumping plant was under consideration. FISCAL YEAR CLOSED Jan. 1, '96. DISTRIBUTION.—Mains, 86 miles; cost extensions met by yearly revenue. Taps, 10,594; made by city, free. Services, lead; paid for by city to street line. Meters: 3; owned, controlled and repaired by city. Use of meters optional with city; compulsory for large and special consumers. Hydrants, public, 635. CONSUMPTION.—(Galls.) av., 9,006,986; max., 9,600,000; min., 8,400,000. PRESSURE.—Ordinary, 90 lbs.; fire, 110 to 115 lbs. FINANCIAL.—Cost, $1,567,752. Expenses, $138,022: Operating, $41,059; int., $96,963. Revenue, Consumers, $159,598; City, none. MANAGEMENT.—Chn., Jno. C. Grant; Treas., Thos. H. Kirby; Ch. Pump. Engr., Arthur C. Jones. Rept. by Secy. and Supt., Robt. Surtees, Aug. 6, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, July 16, '81.

48. **OWEN SOUND,** Grey Co. (7,497.) Bought by town July 1, '90, for $55,000; built in '80 by Parker & Norther Co. SUPPLY.—Springs, 2½ miles from and 170 ft. above town, by gravity. RESERVOIR.—Cap., 600,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains: Cost extensions met by revenue. Taps, 800; made by town, free. Services, w. i.; paid for by town to street line. Meters: 30; owned and controlled by town; yearly rental, 10% of cost. Town can compel use of meters and any consumer may have one; compulsory for churches, hotels, breweries and manufacturing establishments. Meters are just being introduced to prevent waste. Hydrants, public, 75. PRESSURE.—Ordinary, 70 lbs. One steam fire engine is used. FINANCIAL.—Cost, $125,000. Sinking Fund: $1,557 is paid annually to sinking fund, "will pay bonds in 30 yrs. from '90." Expenses, $4,700: Operating, $700; int., $4,000. Receipts pay int., sinking fund, maintenance and about $1,500 annually for extensions, leaving in addition a surplus of $3,000. MANAGEMENT.—Supt., Isaac Markle. Rept. by Chn., T. I. Thompson, July 16, '96. PROJECTED IMPROVEMENTS.—Metering all services. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Mar. 11, '82.

F 7. **PAISLEY,** Bruce Co. (1,328.) Built by town for fire protection. Supply, river, pumping direct. Pumps, cap., 18,000 galls. Mains, 2,200 ft. Hydrants, 6. Pressure, 100 lbs. Cost, $7,500. No rept. since '89-90 Manual.

49. **PARIS,** Brant Co. (3,094.) Built in '83-4 by city. SUPPLY.—Springs, pumping to reservoir. PUMP.—Cap., 240,000 galls.; Worthington, from Northey & Co. Reynoldsville coal used; av. cost, $2.80 per short ton. RESERVOIR.—Cap., 1,200,000 galls.; storage and distributing on hill, 140 ft. above town. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by annual assessment. Taps, 400; made by city, free. Services, lead; paid for by city to property line. Meters, 0. Hydrants, public, 33. CONSUMPTION.—(Galls.) av., 240,000. PRESSURE.—Ordinary and fire, 80 lbs.; steam fire engines are used occasionally. FINANCIAL.—Cost, $55,118. Bonded debt, $34,977: $21,977 at 6%, due 1911; $8,000 at 6%, due 1904; $5,000 at 5%, due 1909. Expenses, $4,282: Operating, $2,185; int., $2,097. Revenue, $5,538: Consumers, $4,288; City, fire protection, $1,120; street sprinkling, $130. MANAGEMENT.—Prest., A. H. Baird, Mayor; Supt., John Brockband; Ch. Pump. Engr., P. Maher. Rept. by Secy. and Treas., S. Dodson. SEWERS.—None. REFERENCE.—Eng. News, Aug. 30, '84.

50. **PARRY SOUND,** Muskoka and Parry Sound Dist. (Est., 1,800.) Built in '92 by town; put in operation in Oct. Engr., Jno. Galt; Contr., J. H. Armstrong; both of Toronto. SUPPLY.—Georgian Bay, pumping to elevated tank and direct. PUMP.—Cap., 1,200,000 galls.; Worthington. Hard and soft wood used; av. cost, $1.45 per cord. TANK.—Cap., 30,000 galls.; 15.8 × 19 ft., on stone tower, 40 ft. high. DISTRIBUTION.—Mains, 4½ miles. Taps, 204. Services, galv. i.; paid for by town to street line. Meters, 0. Hydrants, public, 34. CONSUMPTION.—(Galls.) av., 28,800; max., 72,000; min., 9,600. PRESSURE.—Ordinary, 65 lbs.; fire, 120 lbs. FINANCIAL.—Cost, $35,000. Expenses, Operating, $700. Revenue, $1,200. MANAGEMENT.—Ch. Pump. Engr., G. Murray. Rept. by Mayor, Jno. McClelland, Nov. 14, '96.

51. **PEMBROKE,** Renfrew Co. (4,401.) Built in '93 by city; put in operation in Nov. Engr., W. Chipman, Toronto. SUPPLY.—Ottawa River, pumping to stand-pipe and direct. PUMP.—Cap., 1,200,000 galls.; Northey comp. dup. Wood used. STANDPIPE.—Cap., 140,000 galls.; steel, 20 × 60 ft. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles. Taps, 325. Services, lead and galv. i.; paid for by town to street line. Meters, 0. Hydrants, public, 54. CONSUMPTION.—(Galls.) av., 90,000. PRESSURE.—Ordinary, 73 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $56,800. Bonded debt, $53,500, at 5%; due $3,577 annually for 28 yrs. Expenses, Operating, $1,000. Revenue, Consumers, $3,000. MANAGEMENT.—Rept. by Ch. Pump. Engr., G. W. Martin, Oct. 29, '96. SEWERS.—None.

52. **PENETANGUISHENE,** Simcoe Co. (2,110.) Built in '90-1 by town. SUPPLY.—Springs, pumping to tank. PUMPS.—Pumping done by contract for $1,000 a yr. RESERVOIRS.—Cap., 192,000 galls.; 48,000 and 144,000 collecting; larger used as storage. TANK.—Cap., 60,000 galls. on hill. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 5 miles. Taps made by town. Services, iron; paid for by consumer. Meters, 0. Hydrants, public, 36. FINANCIAL.—Cost, $30,000. MANAGEMENT.—Rept. by W. H. Hewson, June 8, '96. SEWERS.—Has sanitary and storm sewers.

P 8. **PERTH,** Lanark Co. (3,136.) Bids for works (not stated whether public or private) were received latter part of '96. Press rept., Feb., '97, stated contract had been awarded.

53. **PETERBOROUGH,** Peterborough Co. (9,717.) Built in '82 by Peterboro Water Co. SUPPLY.—Otonabee River, pumping direct. PUMPS.—Two 1,000,000-gall. Knowles double acting water-power rept. in '89. Press rept. states new water power pumps, with aggregate cap. of 6,000,000, were added in '93. DISTRIBUTION.—(In '94.) Mains, 15 miles. Taps, 755. Services, lead. Meters (in '90), 4. Hydrants, 113. PRESSURE.—Ordinary, 75 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $90,000. NOTE.—No rept. since '90-1 Manual, except press repts. as to pumps and distribution. REFERENCE.—Eng. News, Jan. 20, '83.

54. **PETROLEA,** Lambton Co. (4,357.) Built in '96-7 by city; was about completed Mar. 25. Engr., Willis Chipman, Toronto. Contrs., Garson & Co., St. Catharines. SUPPLY.—Lake Huron, pumping to stand-pipe. PUMPS.—Cap., 2,400,000 galls.; 1,200,000 high duty fly-wheel, from London Machine Tool Co., and 1,200,000 comp. dup. Hughes. STAND-PIPE.—Cap., 312,000 galls.; 25 × 85 ft. DISTRIBUTION.—Mains, 10 miles; cost extensions met by capital account. Taps made by city. Services, lead; paid for by city. Meters owned, controlled and repaired by city. Use of meters compulsory for all services. Hydrants, public, 93. CONSUMPTION.—Est. (Galls.) av., 240,000; max., 600,000. PRESSURE.—Ordinary, 75 to 100 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $170,000. Bonded debt, $170,000 at 3½%. MANAGEMENT.—Ch. Pump. Engr., Milton Napper. Rept. by Des. Engr., Dec. 26, '96. SEWERS.—Has partial system of sanitary and storm sewers.

55. **PICTON,** Prince Edward Co. (3,287.) Built in '89 by town, and first furnished only fire protection. SUPPLY.—Bay of Quinte, pumping to reservoir. PUMPS.—Cap., 480,000 galls.; Worthington. Reynoldsville mine run coal used. RESERVOIR.—Cap., 840,000 galls.; distributing. DISTRIBUTION.—Cost extensions met by bonds and revenue. Taps, 175; made by licensed plumbers for $1. Services, galv. i.; paid for by consumer. Meters: 15; owned by city and consumers; controlled and repaired by city. Use of meters compulsory for liveries, factories, &c.; optional with city. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 90,000; max., 120,000; min., 36,000. PRESSURE.—Ordinary, 68 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $33,000. Bonded debt at 5%; payable $1,944 yearly for 24 yrs. Expenses, Operating, $2,000. Revenue, Consumers, $1,500. Deficits met by general tax. MANAGEMENT.—Chn., P. R. Young; Treas., J. F. Gillespie; Ch. Pump. Engr., J. D. Robertson. Rept. by Secy. and Supt., R. A. Norman, Jr., June 29, '96. SEWERS.—Has partial system of sanitary and storm sewers.

F 8, P 4. **PORT ELGIN,** Bruce Co. (1,659.) Fire protection works built by town prior to '92, supply being pumped from wells to elevated tanks. Town hopes to secure supply for domestic use in '97. Rept. by Reeve, J. A. Chapman, July 29, '96.

56. **PORT HOPE,** Durham Co. (5,042.) Built in '95 by city; put in operation Nov. 18. Contrs., McQuillan & Co. Small system for fire protection was built in '74. SUPPLY.—Lake Ontario, pumping from filtering basin to tank and direct. PUMP.—Cap., 130,000 galls.; Worthington type. Reynoldsville bituminous coal used; av. cost, $3.60 per short ton. FILTER BASIN.—Cap., 48,000 galls. TANK.—Cap., 84,000 galls.; 27 × 20 ft., on brick tower 80 ft. high. DISTRIBUTION.—Mains, 7 miles. Taps, 120; made by city. Services, galv. i.; paid for by city to street line. Meters: 32; owned by city; yearly rental, $2 and upward. Use of meters compulsory for large users. City cannot compel, but may prohibit use of meters. Hydrants, public, 75. CONSUMPTION.—(Galls.) av., 42,000; max., 54,000; min., 36,000. PRESSURE.—Ordinary, 100 lbs.; fire, 150 lbs. FINANCIAL.—Cost, about, $55,000. MANAGEMENT.—Prest., N. Doyle; Secy. and Treas., N. Gray; Supt. and Ch. Pump. Engr., D. F. McMillan. SEWERS.—None. REFERENCE.—Eng. News, May 17, '84.

P 5. **RAT PORTAGE,** Rainy River Dist. (Not given.) Dec., '96, Geo. Barnes rept. town would probably vote on building works in '97.

P 6. **RENFREW,** Renfrew Co. (2,611.) Town voted in Jan., '97, to build works. Des. Engr., Alex. Potter, 137 Broadway, N. Y. City. Supply, Hurd's Lake, 5 miles distant, by gravity. Repts. by Mayor, J. Clark, Clk., and J. K. Rochester.

57. **SAINT CATHARINES,** Lincoln and Niagara Co. (9,170.) Built in '76-7 by city. SUPPLY.—Lake Erie, through Welland Canal, by gravity to and from impounding reservoir. FILTERS.—Open sand beds. RESERVOIRS.—Cap., 248,000,000 galls. Impounding, 200,000,000; area, 55 acres, at De Cew Falls. Distributing, 48,000,000; area, 9¾ acres. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 26 miles; cost extensions met by special loans. Taps, 1,945; made by city, free. Services, w. i.; paid for by city to street line. Meters, 21; owned by consumers; controlled and repaired by city. Use of meters compulsory for large users. City can compel use of meters and any consumer may have one by paying a min. rate of $10. Hydrants, public, 229. CONSUMPTION.—(Galls.) av., 1,200,000. PRESSURE.—Ordinary, 75 to 114 lbs.; fire, 70 to 75 lbs. One steam fire engine kept in reserve. FINANCIAL.—Cost, $350,645. Bonded debt, $305,000 at 4 and 6%; due '96, '98 to 1919. Expenses: Operating, $8,500. Revenue, $22,852: Consumers, unmetered, $13,352; City, fire protection, $9,160; street sprinkling, $340. Deficits, $3,000 is raised by special tax. MANAGEMENT.—Chn., L. S. Olle; Secy., A. Johnston; Treas., W. A. Mittleberger. Rept. by Supt., J. A. Mills, Sept. 30, '96. SEWERS.—Has some hanitary and almost complete system of storm sewers.

58. **SAINT THOMAS,** Elgin Co. (10,370.) Built in '74 by city. New supply introduced in '91; Engr., Jas. A. Bell. SUPPLY.—Kettle Creek and springs, pumping direct. PUMPS.—Cap., 4,000,000 galls.; two Worthington comp. dup. Youghiogheny bituminous coal used; av. cost, $3.60 per short ton, delivered. FILTERS.—Cap., 1,500,000 galls.; 3—500,000 Hyatt. (New York; makers rept. 2,500,000). RESERVOIR.—Cap., 8,400,000 galls. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 21 miles; cost extensions met by revenue. Taps, 1,697; made by city, free. Services, iron; paid for by consumer. Meters, 49; owned, controlled and repaired by city. Use of meters compulsory for large users. City can compel use of meters and any consumer may have one.

Hydrants (in '90), 76. CONSUMPTION.—(Galls.) av., 600,000. FINANCIAL.—Cost, $150,000. Bonded debt, $120,000 at 4%; due in 30 equal ann. payments. Expenses: Operating, $11,400. Revenue, $13,402: Consumers, $8,363; City, $5,039. MANAGEMENT.—Chn., Jno. Farley; Supt., J. A. Bell; Ch. Pump. Engr., Thos. Allen. Rept. by Secy. and Treas., S. O. Perry, June 11, '96. PROJECTED IMPROVEMENTS.—Stand-pipe. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Feb. 10, '88.

P 7. **SAINT MARYS**, Perth Co. (3,416.) Press rept. stated town would vote Jan. 4, '97, on building works, but that no plans had been adopted.

59. **SANDWICH**, Essex Co. (1,352.) Built in '91 by city; put in operation in Sept. Contr., Miles Hunting, Hamilton. SUPPLY.—From Windsor Water-Works, through meter. DISTRIBUTION.—Mains, 6 miles; cost extensions met by debentures. Taps, 120. Services, lead and galv. i.; paid for by consumer. Meters: 15; owned by consumers. Use of meters optional with city. Hydrants, public, 35; private, 1. CONSUMPTION.—(Galls.) av., 24,000. FINANCIAL.—Cost, $19,000. Sinking Fund, none. Expenses: Operating, $900. Revenue, $900: Consumers, unmetered, $700; metered, $200. MANAGEMENT.—Rept. by Secy., C. H. Ashdown, Dec. 7, '96. SEWERS.—Has partial system of sanitary and storm sewers.

60. **SARNIA**, Lambton Co. (6,698.) Built in '75-6 by city. SUPPLY.—River St. Clair, pumping direct. PUMPS.—Cap., 3,600,000 galls.; 1,200,000 and 2,400,000 crank and fly-wheel Walker. Pittsburg bituminous coal use; av. cost, $2.85 per short ton. FISCAL YEAR CLOSED Sept. 30, '95. DISTRIBUTION.—Mains, 22 miles; cost extensions met by issue of bonds. Taps, 1,385; made by city; $8.75 for ½-in., $10.25 for ⅝-in., $12.50 for ¾-in., including service pipe; larger, in proportion. Services, lead and galv. i.; paid for by consumer. Meters, 7; owned, controlled and repaired by city. Use of meters compulsory for large users. City can compel use of meters and any consumer may have one. Hydrants, public, 143; private, 1. CONSUMPTION.—(Galls.) av., 1,000,000; max., 1,471,000; min., 690,000. PRESSURE.—Ordinary, 35 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $100,000. Expenses: Operating, $6,614. Revenue, $10,906: Consumers, unmetered, $10,363; metered, $443; street sprinkling, $100. Deficits met by general taxation. MANAGEMENT.—Chn., Wm. Logue; Secy., T. Maxwell; Treas., J. B. Barrie. Rept. by Pump. Engr., R. Turner, June 9, '96. PROJECTED IMPROVEMENTS.—Increase in pumping plant. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Jan. 28, '82.

F 9. **SEAFORTH**, Huron Co. (2,641.) Built in '79-80 by town for fire protection, street and lawn sprinkling. Supply, Spring Creek, pumping direct. Pumps, 1,800,000 gall. Inglis & Hunter; 1,200,000 Worthington (?). Reservoir, cap., 480,000 galls. Mains, 3 miles. Pressure, fire, 100 lbs. Cost, $18,000. Operating expenses, $700. Supt., R. S. Roberts.

61. **SHELBURNE**, Grey Co. (1,202.) Built in '89-90 by village. Contrs., Ontario Pump Co., Toronto. SUPPLY.—Driven well, 420 ft. deep, pumping to tank. PUMP.—Deep well, run by windmill. TANK.—Cap., 105,000 galls.; 30 × 20 ft., on 60-ft. trestle. DISTRIBUTION.—Mains, 2 miles. Services, lead; paid for by town to street line. Meters, 0. Hydrants, public, 7. CONSUMPTION.—(Galls.) av., 12,000; max., 24,000; min., 6,000. PRESSURE.—Ordinary, 55 lbs. FINANCIAL.—Cost, $18,000. Expenses: Operating, $261. Revenue, $173. MANAGEMENT.—Rept. by R. A. Riky, July 8, '96. SEWERS.—None.

62. **SMITH FALLS**, Leeds Co. (3,864.) Built in '87 by A. Foster. FRANCHISE.—Provides for purchase of works by city; price to be determined by arbitration. Rates not subject to regulation by city. City to pay $200 per yr. for public service. SUPPLY.—Rideau River, pumping to tank. PUMPS.—Cap., 1,800,000 galls.; Northey, water-power and steam. TANK.—Cap., 40,000 galls.; at elev. 120 ft. DISTRIBUTION.—Mains, 8 miles; cost extensions met by revenue. Taps, 120; made by proprietor; free. Services, galv. i.; paid for by propr. Meters, 0. Hydrants, public, 3. CONSUMPTION.—(Galls.) av., 300,000. PRESSURE.—Ordinary, 70 lbs.; fire, 90 lbs. Steam fire engines are used. FINANCIAL.—Cost, about, $20,000. Expenses: Operating, $700. Revenue, $2,800: Consumers, $1,600; City, fire protection, $150; street sprinkling, $50; public buildings, $1,000. MANAGEMENT.—Rept. by owner, June 9 ,'96. SEWERS.—Has sewers.

63. **STRATFORD**, Perth Co. (9,501.) Built in '83 by Stratford Water Supply Co. FRANCHISE.—Perpetual. Does not provide for purchase of works by city. Rates not subject to regulation by city. Co. was exempt from local taxes for 10 yrs. City to pay $3,780 per yr. for hydrant rental at the rate of $40 each per yr. No legal difficulties. SUPPLY.—Spring Creek, pumping direct. PUMPS.—Cap., 6,300,000 galls.; 2—1,500,000 Worthington comp. and 2,225,000 Laidlaw-Dunn-Gordon, comp. cond. Bituminous coal used; av. cost, $3.50 per short ton. FILTERS.—Gravel. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—(In '90.) Mains, 11 miles. Services, lead. Meters, 1. Hydrants, 72. CONSUMPTION.—(Galls.) av., 500,000. PRESSURE.—(In '90.) Ordinary, 60 lbs.; fire, 80 lbs. and above. FINANCIAL.—(In '90.) Cost, $77,269. Cap. Stock, $35,000. Debt, $43,000: Floating, $3,000 at 6%. Bonded, $40,000 at 5%. Expenses: Operating, $4,610. Revenue, $10,617: Consumers, $6,797; City, fire protection, $3,820. MANAGEMENT.—Prest., Jno. Corrie; Ch. Pump. Engr., Thomas Clark. Rept. by Secy. and

Treas., D. B. Burritt, June 8, '96. SEWERS.—Has sewers. REFERENCE.—Eng. News, Mar. 8, '84.

P 8. **STURGEON FALLS,** Nippissing Dist. (Not given.) Town was to vote Jan. 4, '97, on building works at est. cost of $17,500. Supply, Sturgeon River, pumping direct with water power pumps. Rept. by Town Clk., H. E. McKee, Dec. 4, '96.

64. **SUDBURY,** Nippissing Dist. (Est., 1,370.) Built in '96 by city; put in operation in May. Engrs., Gordon & Rooke. Contrs., Plummer & McCarthy, Sault Ste. Marie. SUPPLY.—Ramsay Lake, pumping to tank and direct. PUMPS.—Cap., 1,728,000 galls.; 2—864,000 Northey. Wood used. TANK.—Cap., 80,000 galls.; steel; 24 x 24 ft., roofed, on iron trestle 75 ft. high. DISTRIBUTION.—Mains, 3½ miles; cost extensions met by general taxation. Taps, 100; made by city. Services, galv. i.; paid for by city to street line. Meters, 0. Hydrants, public, 26. CONSUMPTION.—(Galls.) av., 24,000; max., 60,000; min., 12,000. PRESSURE.—Ordinary, 85 lbs.; fire, 150 lbs. FINANCIAL.—Withheld. MANAGEMENT.—Mayor, S. Fournier; Clerk, T. Fournier; Treas., S. E. Wright; Supt., City Engr.; Ch. Pump. Engr., A. J. Howes. Rept. by L. V. Rooke, Nov. 30, '96. SEWERS.—Has sanitary sewers.

65. **TILBURY CENTER,** Kent Co. (720.) Built in '88 by town. SUPPLY.—Lake St. Clair, pumping direct. PUMP.—Cap., 750,000 galls.; Hughes, dup. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 2 miles. Taps, 117. Hydrants, 16. CONSUMPTION.—(Galls.) av., 100,000. PRESSURE.—(In '89.) Ordinary, 30 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $15,855. Expenses: Operating $690. Revenue, $1,488: Consumers, unmetered, $488; R. R., $1,000. MANAGEMENT.—Town Council. Reeve, W. C. Crawford. Rept. by Town Clk., Sept. 29, '96.

F 10. **TILSONBURG,** Norfolk Co. (2,163.) Built in '75 by town for fire protection. Supply, surface water, pumping direct. Pumps, two 60-HP. rotary water-power. Mains, 1.9 miles. Hydrants, 24. Pressure, 100 lbs. Cost, $40,000. Debt, $19,000. Int., 6%. Operating expenses, $500. No rept. since '89-90 Manual.

66. **TORONTO,** York Co. (181,220.) Bought by city and new works built in '73-8. First works built in '41 by —— Furniss. SUPPLY.—Lake Ontario, pumping to reservoir. PUMPS.—Cap., 55,200,000 galls. Main Station: 4,800,000 hor. comp. cond. and 9,600,000 Worthington comp. cond.; 9,600,000 Inglis & Hunter; 2—12,000,000 Blake. High Service Station: 2—3,600,000 Blake. Av. cost of fuel used: Anthracite egg, $4.19 per short ton; bituminous slack, $2.42 per short ton; wood, $3.50 per cord. RESERVOIR.—Cap., 40,168,320 galls.; area, 9.56 acres. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 248.4 miles. Taps, 40,671. Services, lead, galv. i. Meters, 1,500. Hydrants, public, 2,926. CONSUMPTION.—(Galls.) av., 21,830,000. PRESSURE.—Ordinary, 20 to 80 lbs. FINANCIAL.—Expenses: Operating, $196,914; int. and sinking fund, $224,732. Revenue, $439,172: Consumers, $352,438; City, fire protection, $57,600; street sprinkling, $25,000; public buildings and parks, $4,134. MANAGEMENT.—Chn., Daniel Lamb; Mech. Engr., J. Williams. SEWERS.—Has sewers. REFERENCES.—Eng. News, July 9, '81; Dec. 16, '82; investigation, Sept. 26, '95; rept. of Jas. Mansergh, Mar. 12, '96.

67. **TORONTO JUNCTION,** York Co. (4,518.) Built in '88-9 by town. SUPPLY.—Lake Ontario, pumping direct. PUMPS.—Cap., 4,800,000 galls.; 1,800,000 comp. dup. and 3,000,000 cross-comp. Bituminous slack used; av. cost, $2.50 per short ton. FISCAL YEAR CLOSED Dec. 15, '95. DISTRIBUTION.—Mains, 25 miles. Taps, 800; made by town, free. Services, galv. i.; paid for by town to street line. Meters, 0. Hydrants, public, 195. CONSUMPTION.—(Galls.) 840,000; max., 1,020,000; min., 600,000. PRESSURE.—Ordinary, 110 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $185,700. Expenses: Operating, $7,667. Revenue: Consumers, $4,180. MANAGEMENT.—Rept. by Supt. and Pump. Engr., Jno. Haggas, Oct. 6, '96. SEWERS.—Has sanitary and storm sewers.

68. **TRENTON,** Hastings Co. (4,364.) Owned by Weddal Water Co. since '91; first works built in '70 by Hugh O'Rourke for domestic supply. Present works built in '95. Engr., R. Weddal. No Contr. FRANCHISE.—25 yrs. from '95. Rates are fixed in franchise. Co. not exempt from local taxes. No compensation for public service. SUPPLY.—Springs, by gravity from impounding reservoir and pumping for high service. PUMP.—Cap., 120,000 galls.; Worthington. Wood used. RESERVOIR.—Cap., 28,800 galls. on mountain, at elev. of 180 ft. STAND-PIPE.—Cap., 18,000 galls. FISCAL YEAR CLOSED Feb., '96. DISTRIBUTION.—Mains, 5 miles. Taps, 220; made by Co. Services, iron; paid for by consumer. Hydrants, private, 2. CONSUMPTION.—(Galls.) av., 80,000. PRESSURE.—Ordinary, 60 lbs. Steam fire engines are used. FINANCIAL.—Cost, $20,000. No debt. Expenses: Operating, $600. Revenue, $1,200. MANAGEMENT.—Secy., A. Christie; Treas., J. B. Christie; Supt., Wm. Duff. Rept. by Prest., Robt. Weddal. PROJECTED IMPROVEMENTS.—Extension of mains and enlargement of reservoir. SEWERS.—None.

F 11. **UXBRIDGE,** Ontario Co. (2,023.) Built in '74 by town for fire protection. Supply, creek, pumping direct. Pumps, cap., 1,537 galls.; two Waterous. Mains, 3 miles. Hydrants, 14. Pressure, 140 lbs. No rept. since '89-90 Manual. Reference, Eng. News, Sept. 26, '85.

69. **WALKERVILLE,** Essex Co. (933.) Built in '76 by Hiram Walker & Son to supply their distillery and the town. SUPPLY.—Pumping direct. PUMPS.—Cap., 6,000,-

000 galls.: 3,000,000 Worthington type; 2—1,500,000; all from Kerr Bros., Walkerville. DISTRIBUTION.—Mains, 4 miles. Hydrants, public, 30. FINANCIAL.—Cost, $60,000. NOTE.—Above as rept. June 24, '89; later information refused.

70. **WATERLOO,** Waterloo Co. (2,941.) Built in '89 by Moffett, Hodgkins & Clarke. FRANCHISE.—10 yrs. from '88. Rates are subject to regulation by city. Co. is exempt from local taxes. City sprinkling, free. SUPPLY.—From Berlin Water-Works. FISCAL YEAR CLOSED Oct. 18, '95. DISTRIBUTION.—Mains, 4¼ miles. Taps, 98; made by plumber. Services, galv. i.; paid for by consumer. Meters, 28; owned by Co. and consumers; controlled and repaired by Co.; yearly rental, $3. Use of meters optional with Co.; compulsory for factories and hotels. Hydrants, public, 48. private, 5. PRESSURE.—Ordinary, 80 lbs.; fire, 110 lbs. MANAGEMENT.—Rept. by Supt., J. E. Skidmore, June 11, '96.

71. **WATFORD,** Lambton Co. (1,299.) Built in '94 by Dr. J. A. McLeay. SUPPLY.—Deep wells, pumping to reservoir and direct. DISTRIBUTION.—Taps, 200; made by owner of works including service to property line. Services, iron; paid for by consumer. Hydrants, public, 6; private, 4. CONSUMPTION.—(Galls.) av., 24,000. PRESSURE.—Ordinary, 30 lbs.; fire, 75 lbs. FINANCIAL.—Cost, $10,000. Expenses: Int., $850. MANAGEMENT.—Rept. by J. A. McLeay, Sept. 1, '96.

72. **WELLAND,** Welland Co. (2,035.) Built in '88 by town. SUPPLY.—Lake Erie, through Welland Canal, pumping direct. PUMPS.—Cap., 2,700,000 galls.; 1,800,000 and 900,000 triplex water-power. FILTER.—Area, 1,600 sq. ft.; sand and gravel. DISTRIBUTION.—Mains, 7 miles; cost extensions met by revenue. Taps, 350; made by town. Services, galv. i.; paid for by town to street line. Meters, 1; owned and controlled by town. Use of meters compulsory for R. R. Town can compel use of meters and any consumer may have one. Hydrants, public, 34; private, 5. CONSUMPTION.—(Galls.) av., 800,000; max., 900,000; min., 120,000. PRESSURE.—Ordinary, 80 lbs.; fire, 110 lbs. FINANCIAL.—Cost, $55,000. Bonded debt, $48,000, at 5%; due 1918. Sinking Fund, $8,000, invested at 4%. Expenses: Operating, $600. Revenue, $3,650: Consumers, $1,500; City, fire protection, $1,000; public buildings, $150; other purposes, $1,000. Deficits, int. and sinking fund met by general taxation. Surplus revenue goes into town fund. MANAGEMENT.—Rept. by Supt., J. F. Gross. SEWERS.—Has sanitary and storm sewers.

67. **WEST TORONTO JUNCTION,** York Co. See Toronto Junction.

73. **WIARTON,** Bruce Co. (1,984.) Built in '88-9 by town for fire protection and since extended for domestic use. SUPPLY.—Colpoys Bay (an arm of Georgian Bay), pumping direct. PUMPS.—Cap., 733,000 galls.; Ronald direct acting. Hard wood used; av. cost, $2 per cord. DISTRIBUTION.—Mains, 5¼ miles; cost extensions met by taxation. Taps, 400; made by plumber. Services, iron; paid for by town. Meters, 0. Hydrants, public, 30. CONSUMPTION.—(Galls.) av., 673,900; max., 733,000; min., 561,600. PRESSURE.—Ordinary, 70 lbs.; fire, 140 lbs. FINANCIAL.—Cost, $30,000. Expenses: Operating, $1,500. Revenue: Consumers, $1,500. MANAGEMENT.—Secy., J. W. Ferguson; Treas., A. M. Tyson; Supt., Jas. McNeil; Ch. Pump. Engr., Isaac Dunham. Rept. by J. Dunham, June 9, '96. SEWERS.—None.

74. **WINDSOR,** Essex Co. (10,322.) Built in '72-3 by city. SUPPLY.—Detroit River, pumping direct. PUMPS.—Worthington (3,000,000?). Natural gas used as fuel. FILTERS.—Press repts. stated contract was let in '96 for polarite filter to Macdougall Sons & Co., Montreal, but that injunction proceedings had been started to prevent its construction and that new water board, in '97, decided not to oppose injunction and to cancel contract, if possible. FISCAL YEAR CLOSED July, '95. DISTRIBUTION.—Mains, 36 miles; cost extensions met by frontage tax. Taps, 3,000; made by city. Services, lead; paid for by consumer. Meters, 30; owned and controlled by city; yearly rental, none. Use of meters compulsory for street Ry., liveries, halls. City can compel use of meters and any consumer may have one. Hydrants, public, 254; private, 1. CONSUMPTION.—(Galls.) av., 2,160,000; max., 2,640,000; min., 2,040,000. PRESSURE.—Ordinary, 55 lbs.; fire, 80 lbs. FINANCIAL.—Cost, $240,000. MANAGEMENT.—Prest., H. R. Casgrain; Secy. and Treas., W. A. Hanrahan. Rept. by Supt. and Pump. Engr., Jas. Hall, June 9, '96. SEWERS.—Has sanitary and storm sewers.

F 12. **WINGHAM,** Huron Co. (2,167.) Built in '89 by town for fire protection. Supply, Maitland River, pumping direct. Pumps, cap., 1,264,000 galls.; 2—632,000 Goldie & McCullough dup. Mains, 1 mile. Hydrants, 9. Pressure, 90 lbs. Cost, $10,000. Bonded debt, $8,000, at 6%. Operating expenses, $150. Supt., W. Holmes. Rept. by J. B. Ferguson, Town Clerk, Aug. 16, '96.

75. **WOODSTOCK,** Oxford Co. (8,612.) Built in '91-2 by city. Fire protection system was built by town in '80. SUPPLY.—Springs, three miles distant, pumping direct. PUMPS.—Cap., 4,400,000 galls.; 2—1,000,000 Worthington, a comp. non-cond. and simple high pressure, and 2,400,000 Hughes comp. cond. dup. Reynoldsville lump coal used; av. cost, $3.90 per short ton. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 20 miles; cost extensions met by debentures. Taps, 905; made by city. Services, lead and galv. i.; paid for by city to street line. Meters, 5; owned and repaired by consumers; controlled by city. Use of meters compulsory for Rys. and public buildings. City can compel use of meters and any consumer may have one. Hydrants, public, 128.

CONSUMPTION.—(Galls.) av., 720,000. PRESSURE.—Ordinary, 40 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $158,552. Bonded debt, $137,956: $25,000 at 6%, due 1914; $105,000, at 4%, due 1960; $7,956, at 4½%, due 1919. Sinking Fund: $7,033, invested in municipal debentures. Expenses, $11,500: Operating, $5,442; int., $6,058. Revenue, $13,875: Consumers, unmetered, $6,555; metered, $585; City, $6,735. Deficits are met by general taxation. MANAGEMENT.—Chn., R. M. Revell; Ch. Pump. Engr., Jas. Baird. Rept. by Secy. and Treas., Geo. C. Eden, June 9, '96. SEWERS.—Has sanitary and storm sewers. REFERENCE.—Eng. News, Apr. 26, '84.

MANITOBA.

—? **BAIE SAINT PAUL,** Lisgar Co. (Not given.) E. L. de la Vallee & Son, Montreal, rept. they were Contrs. for works here.

1. **BRANDON,** Selkirk Co. (3,778.) Built in '98 by city. Des. Engr., Warswick, Toronto. Cons. Engr., H. G. Dickson. Contr., E. M. Cathro, Toronto. SUPPLY.—Assiniboine River, pumping direct, filtered. PUMPS.—Cap., 1,800,000 galls.; 2—900,000 Inglis & Son. Wood used; av. cost, $3 per short ton. FILTERS.—Cap., 1,000,000 galls.; New York. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 10.5 miles; cost extensions met by general tax. Taps, 245; made by city, no fee. Services, lead; paid for by city to street line. Meters, 7; owned, controlled and repaired by city; yearly rental, 20% of cost. Use of meters optional with consumer. Hydrants, public, 51. CONSUMPTION.—(Galls.) av., 360,000; max., 540,000; min., 300,000. PRESSURE.—Ordinary, 75 lbs.; fire, 120 lbs. One steam fire engine kept in reserve. FINANCIAL.—Cost, $105,000. Deficits met by general taxation. MANAGEMENT.—Mayor, Jas. A. Smart; Secy. and Treas., J. B. Whitehead; Ch. Pump. Engr., A. R. Crawford. Rept. by Supt., H. G. Dickson, City Engr., Sept. 21, '96. SEWERS.—Has sanitary and some storm sewers.

2, P 1. **WINNIPEG,** Winnipeg Co. (25,642.) Built in '82 by Winnipeg Water-Works Co. SUPPLY.—Assiniboine River, pumping direct. PUMPS.—Cap., 1,500,000 galls.; two double-acting, made by R. Laidlaw & Son, Glasgow, Scotland. Bids for 2,000,000-gall. vert. fly-wheel were invited in '94. FILTER.—Cap., 1,500,000 galls.; New York (rept. by makers). DISTRIBUTION.—Mains, 16 miles. Hydrants, public, 102. FINANCIAL.—Cost, $130,000. Cap. Stock (in '84): Authorized, $300,000; paid-up, $82,500. Bonded debt (in '84), $60,000, at 6%. NOTE.—No rept. official since '90-1 Manual. REFERENCE.—Eng. News, Feb. 23, '84.

PROJECTED MUNICIPAL WORKS.

Press repts. state city took steps in Dec., '96, to build $650,000 works and that Rudolph Hering was engaged as Consult. Engr.

NORTHWEST TERRITORIES.

1. **CALGARY,** Alberta Territory. (3,876.) Built in '90-1 by Calgary Gas & Water-Works Co., Ltd. Contrs., Osborne, Worswick & Co., Hamilton. SUPPLY.—Bow River, pumping direct. PUMPS.—Cap., 1,200,000 galls.; two Brown comp. cond. and comp. dup. FILTERS.—Filter gallery in gravel. FISCAL YEAR CLOSED Oct., '95. DISTRIBUTION.—Mains, 8 miles; cost extensions met by capital fund. Taps made by Co. Services, lead; paid for by consumer. Meters, 4; owned, controlled and repaired by Co. Co. cannot compel, but may prohibit use of meters. Hydrants, public, 38. CONSUMPTION.—(Galls.) av., 480,000. PRESSURE.—Ordinary, 80 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $160,000. MANAGEMENT.—Prest., G. Alexander; Secy. and Treas., H. B. Alexander; Supt., T. S. C. Lee; Ch. Pump. Engr., J. Russell. Rept. by Co., July 29, '96. SEWERS.—Has sanitary and some storm sewers.

BRITISH COLUMBIA.

P 1. **CUMBERLAND,** ———— Dist. (Not given.) Press repts. late in '96 stated works were projected by Co.

1. **ESQUIMALT,** Victoria Dist. (740.) Built in '88 by Esquimalt Water-Works Co. SUPPLY.—Thetis and Upper Thetis Lakes, by gravity. Area of lakes, 120 acres, av. depth, 22 ft. DISTRIBUTION.—(In '88.) Mains, 11 miles. Meters, 89. Hydrants, 32. FINANCIAL.—(In '88.) Cost, $125,000. NOTE.—No rept. since '90-1 Manual.

P 2. **GREENWOOD CITY,** Yale Dist. (Not given.) Dam for reservoir had been built latter part of '96 and it was hoped that balance of works could be constructed in '97.

2. **KAMLOOPS,** Yale Dist. (1,517.) City purchased works from Shuswamp Milling Co. Apr., '95; stated in '90-1 Manual that Kamloops Water Co. owned works. SUPPLY.—Thompson River, pumping to reservoir and direct. PUMPS.—Cap., 2,200,000 galls.; 1,500,000 Northey and 700,000 Worthington. Wood used. RESERVOIR.—Cap., 42,000 galls. DISTRIBUTION.—Mains, 3 miles. Taps, 209; made by city for $5. Services, iron; paid for by consumer. Meters, 0. City can compel use of meters and any consumer may have one. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 90,000; max., 120,000; min., 60,000. PRESSURE.—Ordinary, 60 lbs.; fire, 125 lbs. FINANCIAL.—Cost, $30,000. Bonded debt, $25,000 at 5%, due 1920. Sinking Fund, $1,514; $500 invested at 8%. Expenses, $6,925: Operating, $3,768; int., $1,250; taxes, $1,907. Rept. by T. J. Carment, Feb. 11, '97.

3. **KASLO,** Kootenay Dist. (Est., 1,000.) Built in '96-7 by city. To be put in operation, Feb. 1, '97. Engr., E. N. Cummings. No Contr. SUPPLY.—Kaslo River, by gravity, to and from distributing reservoir. FILTERS.—Cap., 240,000 galls.; open filter-beds. RESERVOIR.—Cap., 420,000 galls.; distributing, covered, 200 ft. above business portion of city; lined with 6 ins. of concrete covered with 3 coats California liquid asphalt. DISTRIBUTION.—Mains, 2.5 miles. Taps, made by city. Services, galv. i.; paid for by city to curb line. Hydrants, public, 20. PRESSURE.—Ordinary, 65 to 90 lbs.; fire, 100 lbs. FINANCIAL.—Cost, $22,500. Bonded debt, $30,000 at 6%. Expenses: int., $1,800. MANAGEMENT.—Chn. W. Wks., R. H. Green. Rept. by Cy. Engr., E. N. Cummings, Jan. 6, '97. SEWERS.—None.

4. **NANAIMO,** Nanaimo Dist. (4,595.) Built in '86-7 by Nanaimo Water-Works Co., Ltd. SUPPLY.—Spring-fed mountain stream, by gravity from impounding reservoirs. FILTERS.—Earth and copper wire cloth; 48 × 48 ft. RESERVOIRS.—Cap., about 90,000,000 galls.; four impounding. FISCAL YEAR CLOSED July 31, '96. DISTRIBUTION.—Mains; cost extensions met by increase of capital. Taps made by Co. at $5 for ½-in.; $7.50 for ¾-in.; $10 for 1-in. Services, ½-in. galv. i.; paid for by consumer. Meters, 20; owned, controlled and repaired by Co. Yearly rental $3 to $12, according to size. Use of meters optional with Co.; compulsory for large or refractory users. Hydrants, public, 40. CONSUMPTION.—(Galls.) av., 720,000. PRESSURE.—Ordinary, 40 to 100 lbs.; fire, 100 lbs. Steam fire engines seldom used. MANAGEMENT.—Prest., Morgan Harris; Secy., M. Wolfe; Treas., E. Pembery. Rept. by Supt., J. W. Stirtan. SEWERS.—No sanitary sewers.

P 3. **NELSON,** Kootenay Dist. (Not given.) Press repts. in '96-7 stated that works were projected.

5. **NEW WESTMINSTER,** New Westminster Dist. (6,641.) Built in '90-1 by city; put in operation Oct. 15. SUPPLY.—Coquitlam Lake, by gravity. SUPPLY MAIN.—22 and 14-in. rivetted steel, 16½ miles long. RESERVOIR.—Cap., 1,960,000 galls.; distributing. DISTRIBUTION.—Mains, 35 miles. Taps, 1,014; made by city for $5. Services, lead; paid for by city to property line. Meters: 50; owned, controlled and repaired by city; yearly rental, $12. Use of meters compulsory for factories, hotels and other large users. City can compel use of meters and any consumer may have one. Hydrants, public, 75; private, 6. CONSUMPTION.—(Galls.) av., 540,000; max., 780,000; min., 420,000. PRESSURE.—Ordinary, 32 to 106 lbs.; fire, 32 to 170 lbs. FINANCIAL.—Cost, $425,000. Expenses: Operating, $2,050. MANAGEMENT.—Chn. Water Comrs., Jas. Jaggers; Treas., Arthur Hill. Rept. by Supt., Wm. Stott, July 20, '96. SEWERS.—Has storm sewers.

—? **REVELSTOKE,** Kootenay Dist. (Not given.) The Revelstoke Water-Works, Electric Light & Power Co. had effected a temporary organization in Dec., '97, and had works in partial operation, and expected to complete them in '97. Engr., P. Cummins. Supply, springs and creeks, by gravity. Est. cost, $15,000. Address Wm. Cowan. Rept. by Provisional Secy., Jas. W. Vail, Dec. 7, '97.

6. **SANDON,** Kootenay Dist. (Not given.) Built in '96 by J. M. Harris and F. T. Kelly; put in operation Sept. 2. Later, owners incorp. as Sandon Water-Works & Light Co. FRANCHISE.—Provides for purchase of works by city on payment of cost and 30% additional with 12% int. Rates are fixed in franchise. SUPPLY.—Mountain stream, by gravity. RESERVOIR.—Cap., 10,000 galls. DISTRIBUTION.—Mains, 1 mile. Taps, 100; made for $3. Services, galv. i.; paid for by consumer. Meters, 0; Co. can compel use of meters and any consumer may have one. Hydrants, public, 4. PRESSURE.—Ordinary, 135 lbs. FINANCIAL.—Cost, $20,000. Cap. Stock: Authorized, $50,000; paid-up, $20,000. No debt. Expenses, Operating, nominal. MANAGEMENT.—Secy. and Treas., F. T. Kelly. Rept. by Prest., J. M. Harris, Sept. 4, '96. SEWERS.—None.

7. **TRAIL CREEK,** Kootenay Dist. (Not given.) Built in '96 by Trail Water & Supply Co.; put in operation Oct. 25. SUPPLY.—Creek, by gravity from reservoir, 275 ft. above town. DISTRIBUTION.—Taps, 40. PRESSURE.—Ordinary, 110 lbs. FINANCIAL.—Cost, $10,000. MANAGEMENT.—Rept. by Prest., R. T. Daniel, Dec. 30, '96.

8. **VANCOUVER,** New Westminster Dist. (13,685.) Bought by city in '92; built in '87-9 by Vancouver Water-Works Co. SUPPLY.—Capilano River, by gravity from impounding and distributing reservoir. RESERVOIR.—Cap., 12,000,000 galls.; area, 6 acres; crest of dam, 417 ft. above lowest, 317 ft. above av., 201 ft. above highest level of city.

and 483 ft. above lowest point in supply main. SUPPLY MAIN.—About 7¾ miles long; first 2½ miles of 22-in. riveted steel, then follows 280 ft. tunnel, 6 × 4 ft., then 4 miles of 16-in. riveted steel, then 1,086 ft. submerged pipe across Burrard Inlet, and finally 1 mile of 16-in. pipe. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 46 miles; cost extensions met by bonds. Taps, 3,000; made by city, no fee. Services, lead; paid for by city to street line. Meters, 80; owned, controlled and repaired by city; yearly rental, $3 to $24. Use of meters optional with city; compulsory for factories, elevators, motors, hotels and stables. Hydrants, public, 210; private, 10. CONSUMPTION. —(Galls.) av., 1,800,000; max., 2,160,000; min., 1,440,000. PRESSURE.—Ordinary, 90 lbs.; fire, 120 lbs. Steam fire engines are used. FINANCIAL.—Cost $782,208. Floating debt, $764,634, at 4%. Sinking Fund, $32,202, invested in mortgage at 8%. Expenses, $42,-916: Operating, $12,816; int., $30,600. Revenue, $65,848: Consumers, unmetered, $38,-000; metered, $12,001; City, fire protection, $7,000; street sprinkling, $1,000; sewer flushing, $1,984; public building, $438; other purposes, $5,475. Deficits met by general taxation. MANAGEMENT.—City Treas., G. F. Baldwin; Supt., Thos. H. Tracy, City Engr. Rept. by Secy., F. W. Boultbee, June 11, '96. SEWERS.—Has sanitary and storm sewers.

P 4. **VERNON,** Yale Dist. (Est., 100.) Press rept. Jan., '97, stated that a committee of council had recommended the securing of a supply from Deep Creek. Est. cost, $30,000. Feb. 3, '97, R. J. Davies, Cy. Clk., rept.: "Nothing decided at present."

9. **VICTORIA,** Victoria Dist. (16,841.) Built in '74-5 by city. SUPPLY.—Beaver and Elk Lakes, by gravity. Area of lakes, 589 acres; drainage area, 2,616 acres; both as given in '89 Manual. FILTER BEDS.—Cap., 3,600,000 galls.; area, 36,000 sq. ft., there being 3—12,000-ft. beds; material, 6 ft. of sand and gravel. Engr., G. E. Jorgensen. Built in '95-6. Small filter bed previously in use. FISCAL YEAR CLOSED Dec. 31, '95. DISTRIBUTION.—Mains, 37 miles; cost extensions met by revenue. Taps, 3,116; made by city at $10 for ½-in., including service to street line. Services, lead; paid for by city to street line. Meters: 282; owned, controlled and repaired by city. Use of meters compulsory for factories, wharves and public buildings. City can compel use of meters and any consumer may have one. Hydrants, public, 140. CONSUMPTION.—(Galls.) av., 1,800,000. PRESSURE.—Fire, 48 lbs. Steam fire engines are used. FINANCIAL.—Cost, $608,975. Bonded debt, $487,500: $92,500 at 7%, due '99; $75,000 at 5%, due 1916; $130,000 at 5%, due 1919; $20,000 at 8%, due 1902; $20,000 at 5%, due 1928; $150,000 at 4½%, due 1945. Sinking Fund: $122,814, deposited in bank at 4% comp. int. Expenses, $52,655: Operating, $15,400; int., $37,255. Revenue, $51,220. Deficits met by consolidated revenue. MANAGEMENT.—Rept. by Water Comr., Jas. L. Raymer, June 12, '96. SEWERS.—Has sanitary and storm sewers.

WATER RATES IN OVER 1,250 CITIES AND TOWNS IN THE UNITED STATES AND CANADA.

INTRODUCTORY.

The figures given in the following pages have been taken from schedules of water-rates received in 1896 and early in 1897 from the officials in charge of the several water-works included. The variety of methods employed in determining what a consumer shall pay for water drawn through a given fixture is great, but it is thought that the figures given will be serviceable for general comparison.

Where an asterisk is prefixed to the name of a place it indicates that the rates given are those charged by a private company; where there is no asterisk the rates are those of a plant owned by the municipality. For convenience the populations of the cities and towns in the list are given in the second column.

Specific explanations for each of the rates tabulated are as follows:

FAMILY RATES.—These are based on a family of five, including servants and children, in a 7 or 8-room house, generally the latter. Where the front width of the house, its number of stories, or any other of a variety of conditions govern the family rate, a figure has been selected as nearly as possible comparable with the above standard. Under the family rate, water is generally allowed for all the uses of the kitchen and about the house wherever carried by hand; in other words, for all household uses so far as possible, from the faucet or faucets at the kitchen sink, or, in some cases, from a faucet in the yard. Where an extra charge is made for a hot water faucet, or kitchen boiler, this is included in the family rate.

WATER-CLOSET.—Some self-closing type of closet is always included under this head, where rates for other kinds are given. Where a very low rate for a pan closet was found in a schedule, accompanied by a moderate one for some more approved sanitary type, the latter has been taken.

BATH TUB.—The rate given always includes the privilege of using both hot and cold water.

WASH BOWL.—The remark under bath tub also applies here. Occasionally the schedules state that no charge is made for a wash bowl where rates are paid for other services, and often wash bowls are not mentioned on the schedules.

HORSE AND CARRIAGE.—This rate includes the use of a stable hose for washing carriages. When the schedules made no mention of a higher rate for carriage washing, with or without hose, it was assumed that no extra charge is made.

HOSE FOR LAWN SPRINKLING.—Where the charge varied with the size of the lawn, a lot 50×150 ft. was taken as a basis. Washing sidewalks is included when specific rates for this service are quoted, and street sprinkling is excluded whenever an extra charge is made for it.

METER RATES.—The first item under this head is the minimum charge per year for water where a meter is used. Next comes the highest and lowest rate, depending upon the quantity of water used. As a side light on these two prices, the next two columns indicate the quantities of water upon which the maximum and minimum rates are based, while the last column states whether the quantities are daily averages, or totals for a month or a longer period. As stated in the foot notes, Sl indicates a sliding scale, but the term is used only when the lowest rate per 1,000 galls. cannot be computed without knowing the exact quantity of water used, as where a certain price is charged, say for the first 10,000 galls., and diminishing prices for each additional like quantity, with a final price named for all above a certain quantity. Sp indicates that the rates, meter or otherwise, are subject to special agreement or to the will of the officials in charge.

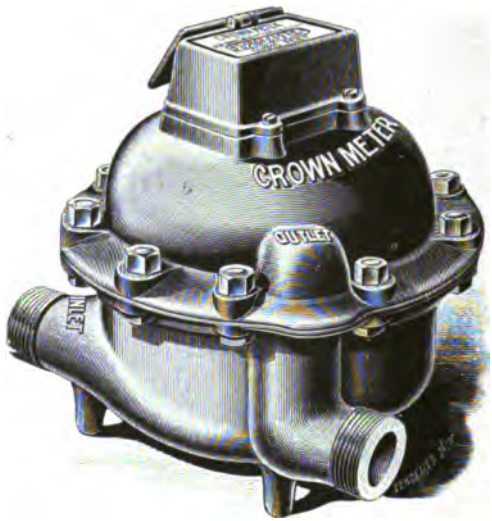
City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	At min. price.	Period.
MAINE.													
Auburn	11.3	6	2	2	..	3	3	..	23	S1	—75	...	Qr.
*Augusta	10.5	8	5	5	0	5	3	..	..	..	...	...	..
Bangor	19.1	5	3	3	1	5	5	..	..	7.4	...	...	Qr.
*Belfast	5.3	6	5	5	2	5	6	25	25	16	—1	+20	Dy.
*Biddeford	14.4	10	6	5	0	8	5	20	25	25	F	F	½ yr.
Boothbay Harbor.	1.7	10	6	5	..	3	4	..	25	25	...	...	..
*Brewer	4.2	5	3	3	1	5	8	..	..	..	...	...	..
*Bucksport	2.9	6	4	4	2	..	..	25	25	16	—1	+20	Dy.
*Calais	7.3	7	5	5	3	5	16	..	40	S1	—10	...	Mo.
*Damariscotta	1.0	8	6	6	4	5	6	..	25	25	+1	+1	Dy.
*Ellsworth	4.8	10	6	5	..	5	5	..	..	..	...	...	..
*Farmington	1.2	8	4	4	2	3	5	..	..	..	...	...	..
*Fryeburg	0.5	10	3	3	..	3	2	..	15	Sp	...	...	..
*Gardiner	5.5	7	5	5	3	5	16	..	40	..	—10	...	..
*Hallowell	3.2	5	6	5	..	5+	Sp	..	..	..	...	...	..
*Lamoine	0.7	10	..	..	..	5	..	..	..	..	...	...	..
*Mechanic Falls..	1.0	8	5	5	3½	5	5	40	50	25	...	+1	Dy.
*Newport	1.2	8	5	5	3	5	5	..	..	..	...	...	..
*Oldtown	5.3	5	3	3	2	5	8	..	..	..	...	...	..
*Phillips	1.4	8	4	3	..	3	4	..	..	..	...	...	..
Pittsfield	2.5	6	5	5	2	7	6	15	25	16	—1	+20	Dy.
*Portland	36.4	7	5	4	..	7	5	..	33	20	...	...	..
*Presque Isle	3.0	10	5	3	1	10	5	40	70	Sp	...	...	..
*Seal Harbor	...	10	2	..	..	1½	5	..	..	..	...	...	..
*Springvale	1.5	7	3	..	..	3	3	No meters in use.					
*Waterville	7.1	7	5	5	3	5	16	..	40	..	—10	...	Mo.
Yarmouth	2.1	8	5	5	1	3	5	..	..	..	...	...	..
*York	2.4	6	5	5	2	Sp	5	..	..	..	...	...	..
NEW HAMPSHIRE.													
*Alton	1.4	5	5	5	2	..	4	..	..	..	...	...	..
Antrim	...	8	3	3	0	3	5	..	..	..	...	...	..
Ashland	1.2	6	2½	2	½	2	3	12	20	20	F	F	..
*Berlin	3.7	9	3	3	2	5	3	..	30	13	...	...	..
*Bristol	1.5	6	5	3	3	2	4	..	..	..	...	...	..
*Claremont	5.6	6	5	2½	1	2	3	12	20	15	—3	+3	Dy.
Concord	17.0	6	3	3	½	1	4½	10	20	7	—1½	+60	Dy.
*Conway	2.3	10	3	3	..	3	2	..	15	Sp	...	...	..
*Derry	2.6	6	4	4	..	..	6	15	25	16	—1	+20	Dy.
Dover	12.8	6	5	5	2	3	5	10	30	20	—100	+500	Yr.
*Exeter	4.3	6	4	4	2	..	6	15	25	16	—1	20	Dy.
Goffstown	2.0	6	2½	2½	½	2	3	10	20	Sp	...	...	..
*Gorham	1.7	10	1½	1½	5	5	5	..	..	..	...	...	..
*Groveton	0.7	10	3	..	1	3	5	..	20	Sp	+5	...	Dy.
†Hanover	1.8	4	2	3	½	1	3	..	..	..	...	...	..
Hillsboro	2.1	8	4	4	..	3	5	..	..	..	...	...	..
*Hudson	1.1	10	5	6	2	8	..	..	..	..	...	...	..
Keene	7.5	6¾	4	4	..	2½	4	..	15	S1	1	...	Dy.
*Laconia	6.1	6	..	..	1	..	..	10	25	25	F	F	..
Lancaster	3.4	8	3	..	1	3	5	..	20	Sp	+5	...	Dy.
Lebanon	3.8	5	2	3	0	1	2	10	30	4	10	1,000	½ yr.
Manchester	44.1	5	3	2½	1	2	7	12	20	20	Flat.		..
Meredith	1.6	6	2	3	½	2	4	10	20	Sp	—12	...	Dy.
Milford	3.0	6	5	5	2	5	5	..	45	30	—¼	+2	Dy.
*Nashua	19.3	6	4	2	0	4	4	16	20	10	—0.8	+9	Dy.
Newport	2.6	6	3	3	0	2	1	12	40	14	—0.9	+1	Dy.
Peterborough	2.5	6	3	2½	1	1½	3	15	37	..	—40	...	Yr.
Rochester	7.4	5	3	3	1½	1½	3	10	20	10	—1	+5	Dy.
VERMONT.													
*Arlington	1.4	5	3	2	2	1½	2	..	..	..	...	...	..
Barton	0.8	4	1¾	1	0	..	1¼	..	..	..	...	...	..
Bradford	0.6	5	2	2	..	1	2	..	..	..	...	...	..
Brandon	3.3	5	4	2	..	1½	3	..	..	..	...	...	..
Burlington	14.6	6	4	4	1	3	4	8	30	S1	—30	...	Mo.
*Derby Line	...	6	4	3	½	1½	4	..	..	..	...	...	..
Enosburgh	2.3	6	3	3	..	1	2	..	..	..	...	...	..
*Hyde Park	1.6	10	2½	2½	..	3½	..	..	..	..	...	...	..
Johnson	1.5	5	2½	2	..	2½	2	..	..	..	...	...	..
Ludlow	1.1	6	3	2	..	1½	2	..	..	..	...	...	..

* Private ownership. M = By meter only. Sp = Special. S1 = Sliding scale (see p. 1.). F = Flat rate. — = Less than. + = More than (see p. 1.).

† Owned jointly by village and Dartmouth College, under name, Hanover Water-Works Co.

The Leading Water Meter Manufacturers of the World.

ACCURACY. EFFICIENCY. DURABILITY.



178,000

CROWN, NASH, GEM and EMPIRE

WATER METERS

In use in 3,000 cities and towns.

National Meter Company

298 BROADWAY, NEW YORK.

CHICAGO, BOSTON. LONDON.

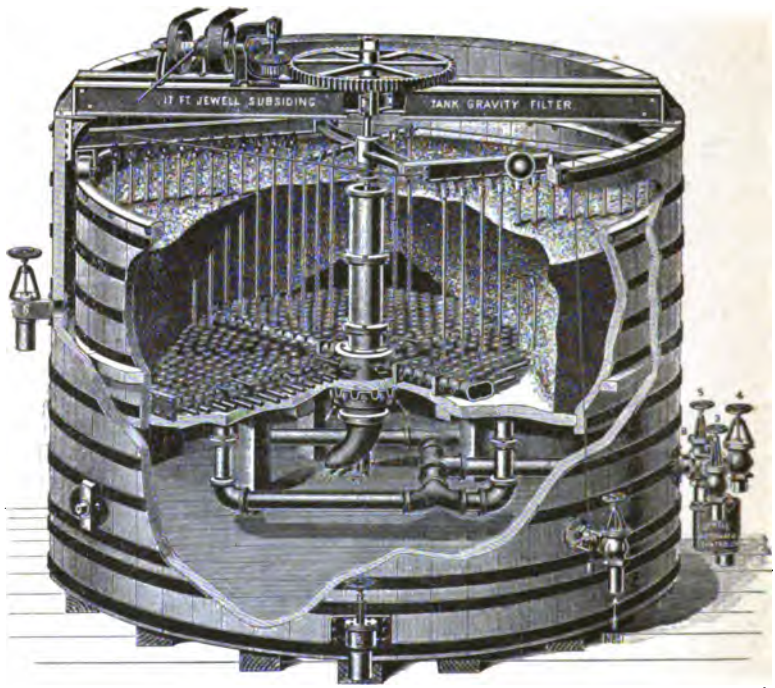
March, 1897.

City and State.	Population, 1890 Census.	Fixture Rates. Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	At min. price.	Period.
Lyndonville	0.6	10	0	0	0	..	..	..	..	..	...	...	..
*Montgomery Cen.	1.7	6	2	2	..	2	2	..	..	..	...	...	..
Newport	1.7	7	..	1½	..	2	2	..	..	..	...	...	..
Poultney	3.0	5	2½	2½	½	2	3	..	..	..	...	...	..
Randolph	1.6	6	3	2	..	1½	3	..	..	..	...	...	..
Rutland	8.2	6	2	..	..	1½	3	..	..	..	...	...	..
St. Albans	7.8	6	3	3	1	2	3	..	..	..	...	...	..
St. Johnsbury	3.9	6	2½	2½	½	1	3	..	13	13	For motors.		
Swanton	3.2	5	4	3	1	2	3	10	40	Sp	...	...	..
Vergennes	1.8	6	4	3	..	2½	2	..	..	..	...	...	..
Windsor	1.4	6½	3	2	..	1	2	..	..	..	...	...	..
MASSACHUSETTS.													
Abington	4.3	6	4	5	2	5	6	10	15	..	...	...	..
Adams	9.2	..	2¼	2¼	..	1	..	..	10	Sl	50	+150	..
*Amesbury	9.8	7	5	5	2½	11	6	..	30	20	...	...	..
Andover	6.1	6	5	5	2	10	5	12	30	20	—100	+500	Yr.
Arlington	5.6	6	5	5	2	8	3	..	40	40	F	F	..
*Ashburnham	2.1	8	3	3	2	5	4	..	..	..	...	...	..
*Athol	6.3	8	4	5	..	5	5	..	33	Sl	...	...	..
Attleboro	7.6	6	..	..	..	..	..	8	30	13	—100	+3,000	Yr.
Avon	1.4	6	5	5	2	5	5	10	35	20	—½	—5,000	Dy.
Ayer City	2.1	6	4	5	2	10	5	10	50	Sp	...	...	..
*Barre	2.2	7	5	5	..	3	5	..	..	..	...	...	..
Belmont	2.1	6	M	M	M	M	M	10	35	25	...	...	..
Beverley	10.8	8	2½	2½	..	5	3	..	20	Sp	+5	...	Dy.
Boston	448.5	10	5	0	0	6	5	15	19	Sp	150	...	..
Brockton	27.3	5	4	4	1½	4	6	8	30	20	—1	+2	Dy.
Brookfield	3.4	6	4	3	1	3	3	12	20	20	F	F	..
Brookline	12.1	3	2½	2½	2½	5	5	..	20	20	F	F	..
Cambridge	70.0	4	3	4	2	4	5	15	30	Sl	...	...	..
Canton	4.5	6	5	5	2	5	5	12	28	Sp	...	...	..
*Cheshire	1.3	10	5	3	..	2	5	..	..	..	...	...	..
Chester	1.3	6	3	2	..	..	..	..	15	15	F	F	..
Chicopee	14.1	6	4	3	..	2	5	..	20	Sl	1	...	Dy.
Clinton	10.4	5	4	4	1	4	5	6	33	10	—25	+100	Mo.
*Cohasset	2.5	10	5	5	..	6	6	..	..	..	...	...	..
Concord	4.4	6	5	4	2	Sp	5	..	30	30	F	F	..
*Cottage City	1.1	6	5	5	2	..	6	15	25	16	—1	+20	Dy.
Danvers	7.5	6	5	5	1	4	3	..	..	..	...	...	..
Easthampton	4.4	6	2	2	..	2	..	..	15	Sl	50	...	Mo.
Fall River	74.4	5	5	..	2½	4	6	8	28	9	0.2	+7	Dy.
Foxborough	2.9	8	4	4	2	8	5	10	30	Sp	100	...	Yr.
Gloucester	24.7	8	6	6	3	8	10	..	50	Sp	2	...	Dy.
Greenfield	5.3	6	2	2	..	..	2	..	20	Sl	—25	...	Qr.
Hatfield	1.2	6	3	3	..	3	3	..	..	..	...	...	..
Haverhill	27.4	5	5	3	..	3	5	10	29	20	—¾	+2¼	Dy.
Hingham	4.6	8	4	4	0	5	5	..	..	..	...	...	..
Hinsdale	1.7	6	3	2	..	1½	2	No meters in use.					
Holbrook	2.5	6	5	5	..	5	5	..	..	..	...	...	..
*Holliston	2.6	7½	5	4	2½	Sp	6	12	40	17	—½	+5	Dy.
Holyoke	35.6	4	2½	2½	..	1½	2½	..	15	Sl	50	...	Mo.
Hudson	4.7	5	4	4	1	3	4	..	..	..	...	...	..
Hull	1.0	10	5	5	0	6¼	6½	..	..	..	...	...	..
*Hyde Park	10.2	6	5	5	2	10	5	..	..	..	...	...	..
Kingston	1.7	6	4	4	2	3	3	..	..	..	...	...	..
Lawrence	44.7	5	4	3	½	3	3¾	7	20	8	+⅛	+96	Dy.
*Lee	3.8	8	4	4	..	4	5	..	..	..	...	...	..
Leominster	7.3	5	4	3	2	3	5	15	30	Sl	—75	...	Yr.
Lexington	3.2	8	4	4	1	6	6	..	..	..	...	...	..
Longmeadow	2.2	7	4	3	..	3	5	..	..	..	...	...	..
Lowell	77.7	6	4	3	0	4	3	7	19	Sl	—150	...	Qr.
Manchester	1.8	6	5	5	2	10	5	12	30	Sp	—100	...	Yr.
Mansfield	3.4	6	4	4	..	9	5	10	30	Sp	—100	...	Yr.
Marblehead	8.2	6	5	5	2	5	5	..	25	Sl	—5	...	Dy.
Marlborough	13.8	6	5	4	2	4	5	6	50	15	...	...	..
Maynard	2.7	6	5	3	2	4	6	10	50	..	...	...	..
Medford	11.1	6	5	5	..	5	3	10	40	10	—2	+45	Dy.
Melrose	8.5	5	4	4	1	3	3	15	33	33	F	F	..
*Milford	8.8	8	5	4	2	5	6	..	66	18	—0.15	+5	Dy.
*Millbury	4.4	8	5	5	2	..	5	..	..	..	...	...	..
Miller's Falls	6.3	8	3	3	2	3	3	..	..	..	...	...	..

* Private ownership. M = By meter only. Sp = Special. Sl = Sliding scale (see p. i.).
F = Flat rate. — = Less than. + = More than (see p. i.).

The Jewell Water Filter,

THE ACKNOWLEDGED STANDARD OF MECHANICAL FILTRATION.



GRAVITY AND PRESSURE FILTERS.

ADOPTED BY THE FOLLOWING CITY WATER-WORKS:

			Gallons.
Wilkes-Barre, Pa	Daily	Capacity	14,000,000
Elmira, N. Y	"	"	6,000,000
Niagara Falls, N. Y	"	"	4,500,000
Burlington, Ia	"	"	4,000,000
Quincy, Ill	"	"	4,000,000
Lorain, Ohio	"	"	3,000,000
Chattanooga, Tenn	"	"	3,000,000
Cedar Rapids, Iowa	"	"	3,000,000
Columbia, S. C	"	"	3,000,000
Lexington, Ky	"	"	2,000,000
Rock Island, Ill	"	"	2,000,000
Ottumwa, Ia	"	"	2,000,000
Belleville, Ill	"	"	1,000,000
Danville, Pa	"	"	1,000,000
Terre Haute, Ind	"	"	1,000,000
Royersford, Pa	"	"	1,000,000
Parsons, Kan	"	"	1,000,000
Winchester, Ky	"	"	1,000,000
Waterloo, Iowa	"	"	1,000,000

The O. H. Jewell Filter Co.
73-75 W. Jackson St., Chicago.

The Morison-Jewell Filtration Co.
26 Cortlandt St., N. Y. 26 S. 15th St., Phila

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $	Price per 1,000 gallons., cts. Max.	Min.	Quantity at each price, 1 = 1,000 gallons. At max. price.	At min. price.	Period.
Millis	0.8	8	4	2	2½	5	5	..	..	..	...	...	..
*Nantucket	3.3	8	4	4	..	6	4	..	..	..	...	...	..
Needham	3.0	All services metered.						6	36	Sl	...	...	..
New Bedford	40.7	2½	2½	2½	1¼	4½	..	..	15	3	...	...	..
Newburyport	13.9	8	6	6	3	5	10	45	50	Sp	—1½	...	Dy.
Newton	24.4	6	M	M	2	M	M	10	35	5	...	...	..
North Adams	16.0	6	3	3	..	..	..	..	15	10	—150	+150	Qr.
Northampton	15.0	6	4	..	..	2	..	..	15	Sl	—50	...	Mo.
No. Brookfield	3.9	6	5	5	2	..	5	..	..	..	...	...	..
*Onset	..	10	4	5	2	Sp	6	..	..	..	...	...	..
Orange	4.6	7	4	3½	0	3	5	10	25	Sl	—25	...	Qr.
Peabody	10.2	4	4	3	..	5½	3	..	..	..	...	...	..
Pittsfield	17.3	5	3¾	2½	..	4	6¼	..	19	Sl	...	...	..
						3	3	..	..	..	...	...	..
Quincy	16.7	6½	5	4	2	10	5	20	30	13	—½	+5	Dy.
Reading	4.1	6	5	5	2	10	5	12	30	20	—100	+500	Yr.
*Revere	5.7	6	5	5	2	10	5	..	25	25	F	F	..
Rockport	4.1	6	5	5	2	..	3	..	..	..	...	...	..
Rutland	1.0	6	5	5	2	6	5	..	..	..	...	...	..
Salem	30.8	4½	5	5	..	6	3	..	20	Sl	—5	...	Dy.
*Southbridge	7.7	6	4	3	1	4	6	..	30	15	—1	+3	Dy.
*So. Framingham	9.2	7½	5	5	2½	10	5	12	40	17	—½	+4½	Dy.
So. Hadley Falls.	4.3	6	2	2	..	2	4	..	15	10	—50	+50	Mo.
Springfield	44.2	8	4	4	..	4	5	..	30	7	—½	+40	Qr.
*Stockbridge	2.1	10	4	4	..	..	5	..	..	..	...	...	..
*Swampscott	3.2	5½	5	5	..	..	5	..	25	Sp	—12	+12	Dy.
Taunton	25.4	5½	5	3	2	..	5	10	25	9	—1	+50	Dy.
Uxbridge	3.4	6	5	5	..	4	6	10	30	30	F	F	..
Walpole	2.6	6	5	5	2	5	5	12	30	Sp	...	...	..
Waltham	18.7	5	3	3	1	..	6	10	25	..	—50	...	Qr.
Ware	7.3	6	5	5	2	6	5	8	25	9	—22½	+1,000	Qr.
*Watertown	7.1	6	M	M	..	M	M	10	35	..	...	...	..
Webster	7.0	5	4	3	1	6	5	8	30	Sp	—100	...	Yr.
Wellesley	3.6	Meter system in use.						6	38	25	16	+16	..
Westborough	5.2	5	4	3	1	3	4	..	30	5	—50	...	½ yr.
Westfield	9.8	6	3	2	..	2	4	..	10	8	—5	+5	Dy.
*Weston	1.7	..	..	..	..	..	..	15	43	Sl	35	...	..
*W. Stockbridge.	1.5	8	2	2	..	..	..	..	..	..	No meters in use.		
Weymouth	10.9	6	5	5	2	5	3	6	30	13	—1	+5	Dy.
Whitman	4.4	6	4	5	2	4	6	6	30	20	—1	+2	Dy.
Winchendon	4.4	Meter system in use.						8	40	Sl	10	...	½ yr.
*Winthrop	2.8	6	5	5	2	10	5	..	25	25	F	F	..
Worcester	84.7	6	4	5	0	3	Sp	..	25	Sp	—1	...	Dy.
RHODE ISLAND.													
*Drownville	0.5	10	5	3	2	Sp	..	10	30	15	—15	+15	..
*E. Greenwich	3.1	8	5	5	2	6	6	10	70	Sl	15	...	Yr.
*Newport	19.5	7	5	5	3	14	10	..	40	Sp	—5	+10	Yr.
Pawtucket	27.6	5	..	..	..	10	8	..	30	6	—1	+100	Dy.
*Phenix	1.0	6	5	5	2	9	5	10	30	30	F	F	..
Providence	132.1	6	5	5	2	Sp	5	10	20	Sl	—300	+300	Yr.
*Wakefield	2.2	9	6	6	3	16	10	..	50	Sl	—2	...	Dy.
*Warwick	17.8	6	5	5	2	9	5	15	30	30	F	F	..
*Westerlev	6.8	7	5	5	2½	Sp	6	10	30	Sl	—167	...	Yr.
CONNECTICUT.													
*Bridgeport	48.9	..	..	..	..	..	..	..	30	4	½	+100	Qr.
*Bristol	7.4	6	3	3	..	3	4	25	30	5	—½	+10	Dy.
*Canaan	1.0	6	3	3	..	..	4	..	..	..	...	...	..
*Danielsonville	...	6	4	4	2	..	6	..	25	10	—1	+20	Dy.
*E. Hartford	4.5	6	3	3	1	4	5	25	30	12	—½	+5	Dy.
Hartford	53.2	5	3	1	..	2	..	..	..	..	...	...	..
*Hazardville	..	8	5	5	..	4	5	No meters in use.					
*Jewett City	...	6	4	4	1	4	5	..	20	Sp	+5	...	Dy.
*Lakeville	..	7½	4	4	2	5	4	..	..	..	...	...	..
Meriden	21.7	5	3	2	..	3	Sp	..	25	10	—½	+20	Dy.
Middletown	9.0	5	3	2	..	2	Sp	..	10	Sl	...	...	..
New Britain	19.0	5	3½	3½	..	..	3½	..	10	Sl	...	...	..
*New Canaan	2.7	6	4	4	1	4	5	..	20	Sp	+5	...	Dy.
*New Hartford	3.2	6	3	3	1	4	5	10	30	6	—1	+100	Dy.
*New Haven	81.3	6	3	3	0	6	3	..	30	10	0.1	—25	Dy.
New London	13.8	5	2	2	..	2	5	..	30	6	—34	+2,700	½ yr.
*New Milford	3.9	6	3	3	..	..	4	..	..	..	...	...	..

* Private ownership. M = By meter only. Sp = Special. Sl = Sliding scale (see p. 1.).
F = Flat rate. — = Less than. + = More than (see p. 1.).

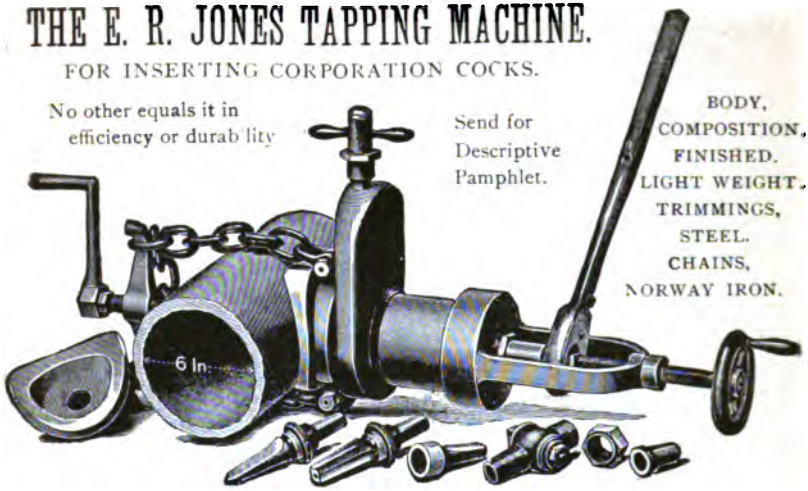
PURCHASE

THE E. R. JONES TAPPING MACHINE.

FOR INSERTING CORPORATION COCKS.

No other equals it in efficiency or durability

Send for Descriptive Pamphlet.



BODY, COMPOSITION, FINISHED. LIGHT WEIGHT. TRIMMINGS, STEEL. CHAINS, NORWAY IRON.

MANUFACTURED BY

CHARLES CARR, - BOSTON, MASS.

LOOMIS IMPROVED WATER FILTERS.

The Only Filter that can Perfectly Cleanse Itself.
No Machinery Required.

WATER-WORKS, MILLS, MANUFACTURING ESTABLISHMENTS, HOTELS, APARTMENT HOUSES, PUBLIC INSTITUTIONS, PRIVATE RESIDENCES.

ESTIMATES FOR LARGE AND SMALL PLANTS PROMPTLY FURNISHED.

Offices:
Philadelphia, New York,
Baltimore, Washington.

LOOMIS-MANNING FILTER CO.,
402 Chestnut Street,
Philadelphia, Pa.

Moore & Co.

ENGINEERS AND CONSTRUCTORS OF PUBLIC WORKS.

SPECIALTY

WATER-WORKS.

95 MILK STREET, BOSTON, MASS.

E. H. GOWING ENGINEER.

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year.						Meter Rates.					
		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $.	Price per 1,000 galls., cts.		Quantity at each price, 1=1,000 galls.		
									Max.	Min.	At max. price.	At min. price.	Period.
Norwich	16.2	5	3	3	..	5	4	..	30	15	—½	+1	Dy.
*Portland	4.7	6	4	4	2	..	6	15	25	13	—1	+20	Dy.
*Putnam	6.5	6	5	5	2	..	5	10	20	10	—1	+20	Dy.
*Rockville	7.8	5	3½	2	1	3	3½	..	20	20	F	F	..
*Southington	5.5	6	3	2	..	..	3	..	20	15	...	...	..
So. Norwalk	4.9	5	3	3	..	2	4	..	30	20	—15	+20	..
Stonington	7.2	6	5	5	2	..	6	15	25	16	—1	+20	Dy.
*Thomaston	1.0	6	3	3	..	6	4	..	..	..	...	...	..
*Thompsonville	4.7	8	5	5	..	4	5	..	..	..	...	...	..
*Torrington	4.3	6	3	3	..	6	4	..	30	4	—0.1	+100	Dy.
*Unionville	...	6	3	3	..	..	5	..	..	..	...	...	..
Waterbury	28.6	5	3	2	..	..	..	..	30	S1	—½	...	Dy.
*West Haven	..	6	3	3	..	6	..	..	30	Sp	0.1	...	Dy.
*Westport	3.7	10	5	5	1	5	7	10	30	10	—1	+20	Dy.
Willimantic	8.6	6	5	3	1	4	7½	10	30	6	—1	+100	Dy.
*Windsor	3.0	10	5	5	..	4	..	..	4	4	...	...	..
*Windsor Locks	2.8	7½	5	4	..	5½	5	..	30	25	—1	+1	Dy.
Winsted	4.8	5	2	..	2	..	5	..	..	..	...	...	..
*Woodbury	1.8	8	3	3	..	6	3	No meter rates.					
NEW YORK.													
Afton	0.7	5	2	3	1	3	3	..	30	10	—1	+25	Dy.
Albany	94.9	16	0	0	0	0	5	..	..	..	...	...	..
Altamont	..	5	2	2	1	2	3	..	15	8	½	...	Dy.
Amsterdam	17.4	6	..	..	1	2½	..	..	30	9	—0.1	+30	Dy.
Angelica	1.0	6	3	3	1	3	3	..	25	10	—1	+5	Dy.
*Ardsley	0.2	..	..	..	..	..	..	..	50	Sp	—2½	...	Mo.
Auburn	25.9	5	3	3	1	4	4	12	37	..	...	...	Mo.
Avoca	1.0	5	..	3	..	..	3	..	..	..	...	...	..
Ballston Spa	3.5	6	3	3	..	4	5	..	..	..	...	...	..
Binghamton	35.0	4	3	3	1	4	3	10	25	6	—1	+14	Dy.
Brooklyn	838.5	11	0	0	0	..	..	..	10	10	F	F	..
*Brooklyn	838.5	11	0	0	0	2½	..	..	10	10	F	F	..
Buffalo	255.7	8	2½	1½	..	2	..	..	6	3	...	...	..
*Burke	2.1	8	0	0	0	..	..	No meters in use.					
*Cambridge	1.6	8	4	3	2	4	8	..	50	8	—1	+40	Dy.
*Canajoharie	2.1	6	..	..	4	4½	..	..	..	..	...	...	..
Canandaigua	5.9	6	4	3	1¼	3	5½	10	8	8	F	F	..
Canaseraga	0.7	4	2	3	¾	1½	6	..	25	5	—½	+15	Dy.
*Canisteo	2.1	6	4	3	¾	3	6	..	30	10	—½	+15	Mo.
Canton	2.6	5	3	3	1	..	..	..	25	20	...	...	..
Cape Vincent	1.3	7	3	3	½	2	2	..	50	S1	10	...	½ yr.
Carthage	2.3	5	3	3	1	3	5	..	25	6	0.1	+20	Dy.
Cattaraugus	0.9	5	3	2	½	1	3	..	..	..	...	...	..
Cazenovia	2.0	6	3	3	1	4	4	5	20	16	—5	+5	..
*Chatham	1.9	8	10	3	2	2	6	8	40	15	—0.1	+7½	Dy.
Chester	2.1	4	2	2	..	2	3	..	20	17	—30	+30	Qr.
Cobleskill	1.8	5	3	3	..	2	7	10	15	8	—½	+20	..
Cohoes	22.5	6	3	2	..	2	6	..	..	..	...	...	..
Cold Spring	4.1	5	3	3	1	4	M	5	20	20	...	...	..
*Collins Centre	2.4	5	3	3	..	3	3	..	..	..	...	...	..
*Corinth	1.2	6	3	3	..	3	4	..	30	Sp	—1	+1	..
Corning	8.6	10	4	4	4	8	12	..	36	S1	10	...	Qr.
*Cortland	8.6	6	4	3	2	10	2	..	40	20	—0.2	+10	Dy.
Coxsackie	1.6	7	2	3	2	10	1	7	28	S1	25	...	Yr.
Dansville	3.8	5	2½	2½	1½	2	3	12	12, for steam engines, only.				
*Davenport	1.8	8	3	3	2	3	3	..	..	..	...	...	..
*Deansboro	0.3	5	..	..	..	2½	3	..	..	..	...	...	..
*Depew	..	8	5	5	3	4	14	..	35	13	0.1	+10	Dy.
Dolgeville	1.2	4	2	2½	1	1½	2½	12	20	3	—½	+5	Dy.
*Downsville	0.5	10	5	5	0	2½	3	..	..	..	...	...	..
Dunkirk	9.4	8	2	2	..	3	2	..	3, for special purposes only.				
Earlville	0.5	5	3	3	1	2½	4	..	..	..	...	...	..
East Randolph	1.0	4	..	..	½	..	3	..	..	..	...	...	..
East Syracuse	2.2	5	3	4	1	2½	4½	5	30	Sp	—5	...	Mo.
*Edgewater	14.3	8	5	5	1	5	10	..	50	25	—50	+750	Qr.
Fairport	2.6	4	2¼	2¼	½	2½	2½	..	..	..	...	...	..
*Far Rockaway	2.3	13	2½	3½	..	0	7	10	40	S1	50	...	Mo.
*Florida	0.6	5	4	4	1	4	4	..	..	..	...	...	..
Fort Edward	4.4	5	2	2	..	3	2	..	30	10	—0.1	+20	Dy.
Frankfort	2.3	6	2	3	1¾	3	3	7	28	S1	25	...	Yr.
Franklin	0.6	8	3	3	..	4	5	..	..	..	...	...	..
*Friendship	1.4	..	..	..	..	..	..	6	30	S1	18	...	Yr.

* Private ownership. M = By meter only. Sp = Special. Sl = Sliding scale (see p. i.). F = Flat rate. — = Less than. + = More than (see p. i.).

DENNIS LONG & COMPANY,

LOUISVILLE, KY.,

MANUFACTURE EXCLUSIVELY

CAST IRON

Gas and PIPE Water

—AND—

SPECIAL CASTINGS

OF ALL SIZES.

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	At min. price.	Period.
Geneseo	2.3	6	5	5	..	5	..	..	30	30	...	...	..
Geneva	7.6	..	..	..	..	..	..	15	40	S1	10	...	Qr.
Gilbertsville	0.7	5	3	3	..	3	3	..	..	..	...	...	..
*Glen Cove	3.8	15	..	5	..	..	6	..	50	50	...	...	..
Gloversville	13.9	4	2	2	..	3	3	..	21	5	0.1	+15	Dy.
Hamilton	1.7	9	4	4	3	3	3	..	40	Sp	7½	Sp	Qr.
*Hillburn	0.9	12	2	2	..	3	4	12	40	S1	7½	...	Qr.
*Holland	0.6	6	2	2	2	3	5	..	..	..	...	...	..
*Hoosick Falls	7.0	6	6	6	3	5	10	..	50	Sp	2	Sp	Dy.
*Huntington	3.0	10	5	5	2	3	5	10	50	..	+15	...	..
Ilion	4.1	6	3	3	1	3	3	..	40	..	—10	...	Qr.
*Ithaca	11.1	10	5	5	1	6	12	..	50	20	—0.2	+8	Dy.
*Jeffersonville	0.7	5	3	3	..	2	7½	..	..	..	...	...	..
Keeseville	2.1	5	3	3	1	3	2	..	..	..	...	...	..
Kingston	21.3	5	3	4	1½	4	4	10	33	Sp	11	...	Qr.
Lansingburgh	10.6	5	4	3	..	2	8	8	13	11	+60	+75	Yr.
Lestershire	..	6	5	5	1	4	3	..	25	6	—1	+14	Dy.
Lowville	2.5	5	2	2	2	2	2	..	50	S1	10	...	½ yr.
*Lyons	4.5	6	..	..	..	3	6	..	50	..	0.1	...	Mo.
*Mamaroneck	2.4	10	5	5	..	10	5	..	..	..	...	...	..
Manlius	0.9	5	3	3	1	4	4	5	30	20	—1	+1	Dy.
*Marlborough	0.9	10	2	2	2	2	2	..	30	8	—½	+40	Dy.
Mechanicsville	2.7	4	3	3	1	3	11	8	20	4	—½	+20	Dy.
Middletown	12.0	5	2	2	..	2	2½	..	20	S1	—15	...	Mo.
Middleville	0.7	4	2½	2½	1	3	2	10	15	8	—½	+20	Dy.
Mohawk	1.8	5	3	3	1	2	3	..	30	S1	10	...	Mo.
Montgomery	1.0	5	2	2	1	3	2½	..	..	..	...	...	..
*Mount Morris	2.3	8	5	4½	2½	4	3	..	150	20	—0.05	+8	Dy.
Naples	1.3	3	4	3	1	3	2	..	..	..	...	...	..
New Berlin	1.0	7	..	4	2½	2	2	..	..	..	...	...	..
Newburgh	23.1	9	..	..	..	..	..	..	10	3	1,000	15,000	Yr.
*New Hartford	0.9	7	4	4	1½	..	3	7	30	8	—½	+70	Dy.
New York	1,515.3	8	0	0	..	6	..	..	13	13	F	F	..
Niagara Falls	9.9	5	3	3	1	3	4	..	12	3	—1	+25	Dy.
Olean	7.4	5½	2⅓	3⅓	1	3⅓	3⅓	..	28	11	Dom.	Mfg.	..
Oneida	6.1	..	..	..	..	..	..	12	25	S1	—40	...	Qr.
*Oneonta	6.3	6	5	5	..	3	5	20	50	S1	10	...	Qr.
*Oswego	21.8	7	5	3	0	..	..	10	40	S1	—15	...	Mo.
*Owego	9.0	7	5	4	..	3	8	..	30	30	—50	—50	Mo.
Peekskill	9.7	7	2	2	..	4	6	37	13	..	2.7	...	Dy.
Perry	1.5	6	3½	2½	..	6	3	..	..	..	...	...	..
Philadelphia	0.8	6	2	3	½	2	2	..	50	S1	10	...	½ yr.
*Phoenicia	0.4	10	3	3	2	5	3	..	..	..	...	...	..
*Phoenix	1.5	9	8	6	..	6	..	..	30	S1	—25	...	Mo.
*Pine Plains	0.6	8	4	4	½	5	5	22	80	13	—0.08	+7½	Dy.
*Port Chester	5.3	8	5	5	..	5	M	8	30	S1	—97½	...	Dy.
Port Henry	2.4	6	2	2	..	3	3	9	25	8	0.1	+20	Dy.
*Port Jervis	9.3	7	3	3	1	4¼	2	16	16	..	100	...	Yr.
Portville	2.3	8	3¼	4½	1⅛	3⅓	5½	..	..	..	...	...	..
Potsdam	4.0	6	2½	2½	..	..	2	..	8	..	...	...	..
Pulaski	1.5	4	2	2	½	1	2	..	..	..	...	...	..
Richfield Springs	1.6	5	5	2½	..	5	5	5	30	S1	—25	...	Yr.
Richmondville	0.7	6½	2	3	1	3	3	5	30	20	—1	+1	Dy.
Rochester	133.9	7	2	2	..	1	4	5	14	10	...	...	..
Rome	15.0	6	5	5	..	8½	..	..	20	S1	—100	...	..
*Round Lake	0.2	5	2	3	..	5	10	..	..	..	...	...	..
Rouses Point	1.9	6	4	4	..	3	9	..	30	6	—1	+40	Dy.
*Salamanca	3.7	10	3	3	..	5	7	..	..	..	...	...	..
Saranac Lake	0.8	12	3	2	1	3	2	..	..	..	...	...	..
Saugerties	4.2	6	4	5	3	8	6	..	25	8	—1	+40	Dy.
*Sidney	1.4	6	3	3	..	5	4	10	15	8	—¼	+20	Dy.
Sing Sing	9.4	8	M	3	¾	2	6	6	20	S1	—53	...	Qr.
*Skaneateles	1.6	10	5	5	2	6	10	..	50	20	—0.2	+8	Dy.
*Springville	1.9	6	3	3	½	3	5	12	25	Sp	—1	...	Dy.
Syracuse	88.1	5	5	4	..	3	6	5	23	S1	—14¼	...	Mo.
Tarrytown	3.6	All meter rates.						..	40	S1	30	...	Qr.
Tonawanda	7.1	5	3	3	½	2	5	..	..	4	Mfg. uses.		..
Troy	61.0	5	3	2	..	5	..	20	5	5	F	F	..
*Utica	44.0	10	6	5	..	6	10	7	30	7½	—½	+70	Dy.
Warsaw	3.1	4	2	3	1½	2	3	..	12	Sp	—1	...	Dy.
Washingtonville	0.7	7	2½	2½	..	Sp	7	..	Sp	Sp	...	...	..
*Waterford	3.5	6	4	3	¾	3	10	..	20	5	—1	+5	Dy.

* Private ownership. M = By meter only. Sp = Special. Sl = Sliding scale (see p. 1.).
F = Flat rate. — = Less than. + = More than (see p. 1.).

Water=Works Pumping Engines

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Giving BEST recorded ECONOMY.

Barr Pumping Engine Company

PHILADELPHIA, U. S. A.

City and State.	Population, 1800 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1=1,000 galls. At max. price.	At min. price.	Period.
Watertown	14.7	4	2	1	..	1	3	5	20	Sl	—19	...	Mo.
Watkins	3.0	6	4	4	2	M	..	..	50	20	—10	+100	Qr.
*Waverly	4.1	10	4	4	4	2	12	12	50	Sl	—10	...	Qr.
Wellsburg	0.9	6	3	2½	2½	2	6	12	20	Sl	—10	...	Qr.
Whitehall	4.4	8	4	2	..	5	4	..	25	25	F	F	..
Yonkers	32.0	..	..	..	..	..	..	4	29	Sp	...	...	..
NEW JERSEY.													
Asbury Park	3.5	6	3	2	1	3	5	..	40	40	F	F	..
Atlantic City	13.1	7	2	2¾	1¾	2	15	..	18	14	—5	+5	..
*Boonton	3.3	11½	5	5	4	7	Sp	..	15	..	...	...	..
*Bound Brook	1.5	8	5	5	1	2	5	..	Sp	Sp	...	...	..
Bridgeton	11.4	5	3	3	1	1	3	..	20	7	...	...	..
Burlington	7.3	5	Sp	3	1	..	2	..	No meters.				
*Clayton	1.8	8	3	4	1	2	8	8	25	15	—5	+5	..
*Dover	5.0	9	5	5	..	3	..	8	27	27	F	F	..
*East Orange	13.3	7½	2½	5	..	3½	10	..	Sp	Sp	...	...	..
*Elizabeth	37.8	14	5	5	..	5	..	..	40	15	0.1	+0.5	Dy.
*Garfield	0.5	6	4	4	2	3	7½	6	30	15	—½	+30	Dy.
*Glassboro	2.6	8	3	4	1	2	8	8	25	15	—5	+5	Dy.
Hightstown	1.9	5	3	3	1	..	2½	..	40	40	F	F	..
Hoboken	43.7	10	2	3	..	..	..	..	20	12	...	...	..
*Irvington	1.9	6	5	4	2	8	10	10	33	33	F	F	..
*Lorraine	..	6	5	4	2	8	5	10	24	24	F	F	..
*Montclair	8.7	7½	2½	5	2	5	5	8¾	20	30	F	F	..
*Morristown	8.2	10	6	6	2	11	..	..	33	33	F	F	..
*Mount Holly	5.7	5½	3	4	0	..	Sp	..	..	..	...	...	..
Newark	181.8	7½	2½	5	..	..	..	..	15	Sl	...	...	..
New Brunswick	18.6	8	5	4	1	7	5	..	13	13	F	F	..
Newton	3.0	6	3	3	2	4	4½	12	25	12	—25	+200	Qr.
*Plainfield	11.3	6	5	4	2	8	5	10	24	24	F	F	..
*Sea Isle City	0.8	11	3	4	2½	..	..	10	35	25	—1	+5	Dy.
*Somerville	3.9	10	4	5	..	5	4	..	20	10	—5	+20	Mo.
South Orange	3.1	6¼	..	..	..	..	..	10	30	20	...	...	..
*Stockton	6.4	5	3	3	1	2	5	..	..	..	...	...	..
*Summit	3.5	7½	2½	5	1½	..	Sp	13	30	Sp	—0.3	...	Dy.
*Vincentown	0.7	5	2	2	1	5	2	..	..	..	...	...	..
*Washington	2.8	8	2½	2½	1	6	3	..	..	..	...	...	..
Woodbury	3.9	5	2	3	1	1	3	..	20	15	—5	+5	Dy.
PENNSYLVANIA.													
Allentown	25.2	7¼	2½	2½	1	5	6	..	25	8	—1,000	+2,000	..
Altoona	30.3	6½	2	3	½	2	..	..	30	5	—0.2	+500	Dy.
*Ambler	1.1	8	5	5	2	5	3	..	30	10	—½	+10	Dy.
*Annville	1.3	5	2	3	1	5	3	..	..	..	...	...	..
*Archbald	4.0	8	4	4	..	2	6	..	20	20	F	F	..
*Austin	1.7	12	4	5	..	6	6	..	..	..	...	...	..
*Beaver Falls	9.7	10	3	4	0	3	5	..	..	..	...	...	..
*Beaver Meadows	1.1	7	3	4	1	3	¼	..	..	..	...	...	..
*Berwick	2.7	7	4	4	..	3	1½	..	..	..	...	...	..
*Berwyn	0.8	..	..	..	..	..	..	12	35	Sl	—25	...	Qr.
Bethlehem	6.8	7½	2	3	1	5	3	..	50	10	50	400	Yr.
*Bloomsburg	4.6	6	3	3	1	3	4	..	35	7	—0.1	+25	Dy.
Bradford	10.5	4½	2	1¼	½	5	5	..	6	6	F	F	..
*Bridgeport	2.7	7	1	3	2	4	3	..	15	6	...	...	..
*Brookville	2.5	14	6	6	2	..	..	..	..	..	...	...	..
*Bryn Mawr	0.9	..	..	..	..	..	..	12	35	Sl	—25	...	Qr.
*Canton	1.4	6	4	4	1½	3	4	..	..	..	...	...	..
*Carbondale	10.8	6	3	3	2	1½	3	..	..	..	8	...	..
*Catasauqua	3.7	5	2	3	..	1	5	..	..	..	...	...	..
Chambersburg	7.0	3	1	3	1	1	1	..	8	8	F	F	..
*Chester	20.2	6	2	5	2	2½	6	6	30	8	—½	+10	Dy.
*Christiana	1.1	5	3	3	1	3	1	..	..	..	...	...	..
Cochranton	0.7	5	1½	2	1	2	3½	..	..	..	...	...	..
*Conshohocken	5.5	7	2	3	1	..	3	..	15	15	...	...	..
*Cresson	0.3	8	Sp	3	1	Sp	Sp	..	..	..	...	...	..
*Curwensville	1.7	6	2	2	½	1¼	3	..	..	..	...	...	..
Danville	8.0	6	..	2½	1	2¼	4	..	15	15	F	F	..
*Dubois	6.1	8	3	3	½	3	5	..	25	5	—1	+20	Dy.
Duquesne	0.5	7	3	2	0	3½	5	..	30	4	—0.2	+500	Dy.
E. Greenville	0.5	5	2	2	1	3	5	..	..	..	...	...	..
*Eddystone	0.6	10	4	4	1¼	3	8	10	25	20	—5	+5	Dy.
*Elizabeth	1.8	11	3	4	1½	4½	..	..	20	5	—1,000	+20,000	Yr.

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ESTABLISHED 1854.

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Where water has to be paid for at a certain rate per thousand gallons, it is to the interest of parties using water motors to buy the motor which will develop the greatest amount of power with a given quantity of water. The Pelton water motor is offered to the public as such a motor, and in point of efficiency, durability, scientific design and mechanical construction it is far superior to any other water motor made in this or any other country. It is also the cheapest to buy on the basis of actual horse-power developed.

Information regarding any particular service, as also circulars giving complete tables of power, speed and water consumption will be furnished on application.

Address THE PELTON WATER WHEEL COMPANY.
143 Liberty St., New York City, or 121 Main St., San Francisco, Cal.

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	At min. price.	Period.
*Elizabethtown ..	1.2	5	2	3	1	5	5	..	..	..	...	...	..
*Elizabethville ..	0.7	6	2	2	1	..	2	..	..	..	...	...	..
Emaus	0.9	4	2	2½	..	..	..	No meters in use.					
*Emporium	2.1	6	3	4	2	4	4	..	..	..	...	...	..
Erie	40.6	5	3	3	1	2	3½	15	6	6	F	F	..
*Factoryville	0.6	8	3	3	..	2	3	..	..	..	...	...	..
*Fleetwood	0.9	6	6	3	1½	4½	3	..	..	..	...	...	..
*Frackville	2.5	7½	..	..	..	..	..	6	30	30	F	F	..
*Franklin	6.2	13	5	6	0	7	..	..	..	..	...	...	..
*Fredericksburg .	0.6	3½	3	3	2	3	2	..	..	..	...	...	..
*Galeton	0.7	8	3	5	..	5	5	No meters in use.					
*Gettysburg	3.2	6	6	3	1	5	Sp	..	25	8	+½	+10	Dy.
*Hamburgh	2.1	6	6	3	1½	4½	3	..	..	..	...	...	..
*Hanover	3.7	6	2	2	..	2	3	..	13	10	...	...	..
Harrisburg	39.4	6½	3	4	2	5	2	..	15	2	Dom.	+200	Mo.
Holidaysburg	3.0	5	4	3	..	..	3	..	..	..	...	...	..
*Holmesburg	..	5	1	3	1	5	5	..	8	8	F	F	..
Homestead	7.9	8	3	3	1	3	4	..	..	..	...	...	..
*Honesdale	2.8	6	4	4	3	Sp	..	..	..	..	...	...	..
Howard	0.6	4	..	2	2	..	..	..	..	..	...	...	..
*Jenkintown	1.6	10	3	..	1½	6	5	15	24	16	—750	+1,500	Yr.
*Jersey Shore....	1.9	10	2	5	1	8	8	..	..	..	...	...	..
*Kutztown	1.6	6	6	3	1½	4½	3	..	..	..	...	...	..
*Laceyville	0.6	6	3	2	..	Sp	Sp	No meters in use.					
Lancaster	32.0	6	3	3	..	5	..	..	..	5	...	...	..
*Langhorne	0.7	10	3	3	1	5	4	..	40	20	...	...	..
Lebanon	14.7	3½	2½	2	..	..	5	..	10	S1	25	...	..
*Leechburg	1.9	12	4	5	2	3	6	..	25	25	F	F	..
*Lewisburg	3.2	6	3	3	1	1	3	6	5	5	F	F	..
*Lykens	2.5	5	2	2	1	2	2	..	..	..	...	...	..
*McDonald	1.7	16	5	5	2	3½	6	..	..	..	...	...	..
McKeesport	20.7	5	4	4	2½	8	6	..	30	4	—0.2	+500	Dy.
*Mahanoy City...	11.3	5	5	4½	..	1	2½	..	13	13	F	F	..
Malvern	0.6	6	2	3	1	6	..	..	..	..	...	...	..
*Manheim	2.1	5½	3	3	1	4	4	..	..	..	...	...	..
*Marietta	2.4	6	2½	3	¾	2	2	..	..	..	...	...	..
*Mauch Chunk...	4.1	5	2	2	..	..	3	No meters in use.					
*Meadville	9.5	7	3	3	..	2	7	..	15	8	½	+20	..
*Meyersdale	1.8	6	3	2	1	3	5	..	..	30	...	...	..
*Mifflintown	0.9	6	6	3	1	5	2	..	..	..	...	...	..
Millvale	3.8	5	3	3	0	7	..	..	30	8	—½	+40	Dy.
Monaca	..	5	4	3	2½	2	4½	..	30	8	—½	+40	Dy.
*Montrose	1.7	10	5	5	..	5	6	..	..	..	...	...	..
Morrisville	1.2	7	3½	3	1¼	7	3½	..	25	25	F	F	..
*New Bloomfield..	1.1	5	3	3	..	3	5	..	50	50	F	F	..
*New Castle.....	11.6	9	3	3½	2	..	..	..	..	..	...	...	..
*New Cumberland	0.8	6	3	3	2	3	3	10	10	10	...	...	..
*New Holland....	1.1	6	3	3	..	..	5	..	35	35	F	F	..
*Newmanstown ..	0.6	5	2	1½	½	1½	1	..	..	..	...	...	..
*New Milford....	0.8	6	2	2	2	3	5	..	..	..	...	...	..
*Newport	1.4	6	6	3	1½	4½	3	..	..	..	...	...	..
*Newville	1.6	6	6	3	1½	4½	3	..	..	..	...	...	..
*New Wilmington	0.7	11	5	5	0	1	5	..	..	..	...	...	..
*Norristown	19.8	7	1	3	..	4	3	13	20	5	1	3,600	Qr.
North East.....	1.5	5½	2½	3	½	4	5	..	25	13	...	...	..
*Oak Lane.....	..	..	..	..	..	..	..	12	25	25	F	F	..
Oil City.....	10.9	10	2½	2½	1½	3	..	..	25	6	...	...	..
Orwigsburg	1.3	5	1½	1½	1	3	..	..	..	8	...	...	..
*Patterson	0.8	6	2	3	..	5	2	..	..	..	...	...	..
Philadelphia	1,047.0	5	1	3	1	5	5	..	40	40	F	F	..
Phoenixville	8.5	6	1	3	1	..	3	..	9	7	Mfg., only.		..
Pittsburg	238.6	8	3	1	0	4½	8	..	20	S1	—500	...	..
*Pittsburg	238.6	8	3	1	0	4½	8	..	20	S1	—500	...	..
*Plymouth	9.3	7	4¾	4¾	2½	..	..	..	10	10	F	F	..
*Port Allegany .	1.2	10	3	4	..	5	5	No meters in use.					
*Pottsville	14.1	7	4	2	..	3½	..	12	20	S1	—7½	...	Mo.
*Quakertown	2.2	6	4	3	1½	3	5	..	..	..	...	...	..
Reading	58.7	4½	2	2½	0	8	4	..	40	S1	—1	...	Mo.
*Red Lion.....	0.5	6	..	3	1	3	3½	..	..	..	...	...	..
*Royersford	1.8	8	3	3	2	2	Sp	..	40	20	...	...	..
Saltsburg	1.1	6	4	4	3	3½	5	10	20	..	...	...	..
*Sandy Lake.....	0.7	7	4	4	1	4½	..	No meters in use.					

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*Scottdale	2.7	6	4	4	2½	7	4	..	30	30	F	F	..
*Scranton	75.2	6	4	4	..	3	3	..	25	8	—5	+50	Mo.
Sewickley	2.8	12	3½	3½	2½	4	4	..	..	..	..	..	..
*Shamokin	14.4	7	3	3½	1	2	3	12	27	S1	—7½	..	Mo.
*Sharon	7.5	6	5	5	2	4½	..	..	43	20	—¾	+7½	Dy.
Sharpsburg	4.9	5	4	4	2½	8	4	..	30	8	—½	+40	Dy.
*Shickshinny	1.4	6	4	4	2	2	..	..	..	..	..	..	..
Somerset	1.7	6	3	3	1	7	..	..	..	..	..	..	..
*So. Bethlehem	10.3	7½	2	3	1	5	..	..	..	..	..	..	..
*So. Easton	5.6	3	4	3	..	..	6	..	..	..	..	..	..
*Steelton	9.3	6	6	3	1	7	3	..	10	2	1	+200	Dy.
*Summit Hill	2.8	7¼	3	1¾	..	Sp	Sp	..	..	..	..	..	..
*Tionesta	0.7	10	2½	2½	1½	1½	3	..	..	..	..	..	..
Titusville	8.1	8	3	4	..	2½	2½	..	33	10	0.3	+10	Dy.
*Tunkhannock	1.3	8	3	2	..	..	Sp	..	20	20	F	F	..
Union City	2.3	4	1½	2	½	4	6	..	..	..	..	..	..
*Verona	1.5	9	3	4	1½	..	..	..	30	..	..	..	..
*Washington	7.1	14	5	10	5	6	10	12	60	S1	—10	..	Qr.
*Waynesburgh	2.1	11	5	5	..	5	..	..	..	..	..	..	..
Westfield	1.1	7½	2	2½	1¼	6	6	..	30	S1	10	..	Yr.
*Wilkes-Barre	37.7	8	4	4	2	..	..	..	20	S1	—10	..	Mo.
*Wilkinsburg	4.7	..	..	..	..	..	..	10	15	S1	..	..	..
*Williamsport	27.1	7	2	5	1	5	5	15	30	10	..	..	..
*Womelsdorf	1.1	6	6	3	1½	4½	3	..	..	..	..	..	..
*Wyalusing	0.4	10	4	4	..	..	6	..	..	..	..	..	..
DELAWARE.													
Dover	3.1	5	3	3	1	2	..	..	20	15	—5	+5	Dy.
Middletown	1.5	3	2	3	0	1½	..	..	..	..	..	..	..
Milford	1.2	3½	3	3	1	2	..	..	..	..	..	..	..
Newark	1.2	5	3	3	2	2	3	..	20	15	—5	+5	Dy.
Wilmington	61.4	5	2	3	1	4	2	..	10	S1	—2	..	Qr.
MARYLAND.													
*Chestertown	2.6	6½	3	3½	..	1¼	..	..	..	..	..	..	..
*Easton	2.9	6	3½	3½	1¼	2½	..	..	25	20	—5	+5	Dy.
*Hagerstown	10.1	8	..	..	..	..	..	..	50	8	0.1	+20	Dy.
*Lonacoming	3.9	9	3	3	1	5½	..	..	..	..	..	..	..
*Port Deposit	1.9	6	6	..	1½	..	9	..	..	..	..	..	..
*Salisbury	2.9	6	3½	3½	1¼	..	M	..	25	20	—5	+5	Dy.
*Westminster	2.9	6	3	3	..	2	..	..	18	S1	—5	..	Mo.
DIST. OF COLUMBIA.													
Washington	188.9	7¼	..	..	..	1½	..	10	3	3	F	F	..
VIRGINIA.													
*Berkley	3.9	8	3	3	..	..	..	6	40	S1	5	..	..
Charlottesville	5.6	10	3½	2	..	..	3	..	..	..	..	..	..
*Clifton Forge	1.8	9	4	4	..	4	5	..	..	..	..	..	..
*Covington	0.7	9	5	5	..	1¼	2½	..	..	..	..	..	..
*Elkton	0.1	9	3	3	1½	..	5	..	..	..	..	..	..
*Farmville	2.4	12	3	4	2	11½	6	..	30	S1	—10	..	..
Fredericksburgh	4.5	4	..	..	..	..	..	..	6	6	..	..	..
Lynchburg	19.7	6	3	3	..	..	5	6	20	S1	—½	..	Qr.
Martinsville	1.9	6	5	3	..	..	5	..	..	..	..	..	..
Norfolk	34.9	8	3	3	..	..	6	..	40	Sp	—1	..	Dy.
*Portsmouth	13.3	8	3	3	2	7½	..	..	30	20	—5	+5	Dy.
*Pulaski	2.1	..	..	..	..	..	..	9	30	Sp	—1	..	Dy.
Richmond	81.4	5	3	3½	1½	..	9½	..	15	7	—15	+240	Mo.
*Roanoke	16.2	9	3	3	1½	..	5	..	25	10	..	..	..
Wytheville	2.6	5	1½	..	..	..	2	..	20	10	..	..	..
WEST VIRGINIA.													
*Bramwell	0.5	9	3	3	1½	..	..	9	25	Sp	..	..	..
*Charleston	6.7	8	5	5	..	4	..	..	50	13	—½	+10	Dy.
Grafton	3.2	7	2	2½	..	2	4	..	30	S1	—10	..	Qr.
Keyser	2.2	4	1	1	..	2	..	..	..	..	..	..	..
Mannington	0.9	5	3¾	2½	..	5	3¾	..	..	..	..	..	..
Martinsburg	7.2	3	2	2	..	..	2	..	..	..	..	..	..
*New Cumberland	2.3	8	3	5	..	3½	..	..	..	..	..	..	..
Salem	0.3	3¾	2¼	1½	..	1¼	..	..	..	..	..	..	..
Sistersville	0.5	5½	5	3	..	3	4	..	15	8	—250	+500	..
*Weston	2.1	8	5	4	1	4	5	..	50	20	—½	+10	Dy.

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F = Flat rate. — = Less than. + = More than (see p. 1.).

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	At min. price.	Period.
Wheeling	34.5	..	6	6	..	2	7	..	..	..	...	...	..
NORTH CAROLINA.													
*Fayetteville	4.2	8	5	3½	..	4	6	12	25	Sl	—1	...	Dy.
*Henderson	4.2	8	6	5	2	10	..	..	40	18	—1	+10	..
*Salisbury	4.4	6	4	4	1	3	5	..	30	Sp	+0.1	...	Dy.
*Wilmington	20.1	6	4	4	2	5	7½	..	20	Sp	—112	...	Mo.
Wilson	2.1	6	3	4	2	3	4	8	..	..	...	...	..
Winston	8.0	8	5	2	..	..	5	4	30	Sl	...	...	..
SOUTH CAROLINA.													
*Charleston	55.0	12	4	4	1	12	..	12	60	20	—15	+160	Mo.
Columbia	15.4	12	3	5	2	..	10	..	..	..	...	...	..
*Greenville	8.6	7¼	2½	3	..	3	5	..	40	Sp	—1	...	Dy.
*Spartanburg	5.5	9	4	4	1	3	5	..	30	Sp	—1	...	Dy.
*Sumter	3.9	8	4	4	2	5	8	..	25	20	—5	+5	Dy.
Yorkville	1.6	8	4	3	..	..	11	..	..	..	...	...	..
GEORGIA.													
Americus	6.4	10	3	3	3	..	2	10	30	20	...	...	..
Athens	8.6	4	4	4	..	2	6	..	25	Sp	...	...	..
Atlanta	65.5	Meter system.						10	13	Sl	—150	...	Mo.
Barnesville	1.8	10	..	..	..	..	..	..	..	10	...	...	..
*Columbus	17.3	Meter system.						12	20	7	—½	+20	Dy.
Cuthbert	2.3	5	3	4	..	3	6	..	..	..	...	...	..
Dalton	3.0	4	3	4	..	..	10	..	10	10	F	F	..
*Dawson	2.3	12	8	8	4	7	12	..	..	..	...	...	..
Gainesville	3.2	5	..	3	..	..	10	..	..	..	...	...	..
Griffin	4.5	12	6	6	6	6	6	12	15	10	...	...	..
*La Grange	3.1	..	5	5	0	6	10½	..	50	20	0.2	+8	Dy.
*Marietta	3.4	10	4	4	..	4	6	..	50	20	—0.1	+10	Dy.
*Milledgeville	3.3	10	4	6	2	4	12	25	40	20	—0.2	+5	Dy.
Rome	7.0	6	5	5	..	8½	..	..	20	Sl	—100	...	..
Savannah	43.2	15	0	0	..	2	5	..	12	Sl	...	—10	..
Thomasville	5.5	10	4	3	..	4	M	..	..	15	...	...	..
Waycross	3.4	8	3	3	1	..	3	12	20	20	F	F	..
FLORIDA.													
Bartow	1.4	6	3	2	..	5	6	..	25	10	+1	+70	Mo.
Jacksonville	17.2	Meter system.						12	15	7	—½	+7½	Dy.
*Orlando	2.9	9	4	6	4	6	10	15	35	7	—1	+100	Dy.
*Palatka	3.0	10	5	5	2	4	12	25	40	20	—0.2	+5	Dy.
*Pensacola	11.8	..	..	..	..	..	..	10	50	Sl	10	...	..
*Quincy	0.7	12	6	0	..	6	6	..	27	Sp	...	...	..
*Sanford	2.0	12	3	4	4	8	..	..	100	15	+1	+500	Mo.
*Tallahassee	2.9	12	8	6	4	7	12	..	33	Sp	...	...	..
ALABAMA.													
*Anniston	10.0	10	6	5	1	8	10	24	50	Sl	—5	...	Mo.
*Birmingham	26.2	12	5	4	..	..	..	..	30	7	—1	...	Dy.
*Bridgeport	1.1	Meter system.						12	50	17	—5	+100	Mo.
*Decatur	2.8	8	3	4	2	12	8	10	24	Sl	—½	...	Dy.
Demopolis	1.9	8	5	5	4	2½	5	..	30	10	0.1	+10	Dy.
*Greenville	2.8	6	3	6	..	..	10	10	25	25	F	F	..
*Mobile	31.1	10	6	5	1	8	10	24	50	50	F	F	..
*Montgomery	21.9	9	10	8	2	4	..	10	25	Sl	+20	...	Qr.
*Opelika	3.7	10	5	5	2	6	7½	..	50	20	0.2	+8	Dy.
*Selma	7.6	8	3	3	2½	5	5	..	35	Sl	—10	...	Qr.
Troy	3.4	12	6	6	2	15	10	12	25	25	...	...	..
MISSISSIPPI.													
*Bay St. Louis	2.0	10	7½	10	..		..	..	..	..	...	...	..
*Jackson	5.9	7	5	5	1	8	7	..	..	..	...	...	..
*Meridian	10.6	7	5	5	4	1	5	..	40	15	0.1	+10	Dy.
*Vicksburg	13.4	9½	5	7	¾	7	7½	..	36	Sl	—10	...	Mo.
*Yazoo City	3.3	7	5	5	..	8	7½	..	30	13	—1	+25	Dy.
LOUISIANA.													
Alexandria	2.9	4	4	..	..	3	3	..	30	Sp	0.1	...	..
*Baton Rouge	10.5	11	..	5	..	3½	7½	..	50	15	0.1	+10	Dy.
*Lake Charles	3.4	14	6	0	..	..	Sp	60	50	25	0.1	+30	Dy.
Thibodaux	2.1	4	2	..	0	3	4	..	..	..	...	...	..
TENNESSEE.													
*Bristol	3.3	7	4	4	2	2	11	10	25	25	F	F	..
Clarksville	7.9	7	5	6	..	6	6	..	40	25	0.1	+1	Dy.

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City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max price.	At min. price.	Period.
*Greenville	1.8	9	5	6	3	..	12	16	33	33	F	F	..
Harriman	0.7	7	3	3	..	3½	2	..	30	Sl	—5	...	Mo.
Jackson	10.0	10	6	3	..	3	8	..	..	..	...	...	..
*Johnson City	4.2	9	..	6	3	..	5	..	..	..	...	...	..
*Knoxville	22.5	9	5	5	..	..	8	10	25	7	—50	+1,000	Mo.
*Memphis	64.5	8	5	5	..	5	10	..	..	..	...	...	..
Morristown	2.0	6	4	3	..	3	5	..	20	6	—50	—1,000	Mo.
Nashville	76.2	10	6	8	..	..	..	10	15	7	17	+9,000	Qr.
*Shelbyville	1.8	7½	6	6	1	Sp	7½	..	..	..	...	...	..
*So. Pittsburg	1.5	7	5	5	4	Sp	Sp	..	..	..	...	...	..
KENTUCKY.													
Bowling Green	7.8	12	3	3	2	..	8	10	25	13	...	...	..
*Burnside	0.7	8	6	6	2	8	Sp	91	25	Sp	1	...	Dy.
Covington	37.4	8	3	6	1	3	Sp	10	15	8	—10	+100	Dy.
Danville	3.8	8	4	4	0	7½	8	18	50	Sl	¼	...	Dy.
Falmouth	1.1	3½	2	2	¾	1½	4	..	..	..	...	...	..
*Frankfort	7.9	7	3	2½	1	4¼	..	65	15	Sl	+1.2	...	Dy.
Henderson	8.8	6	..	3	..	4	7½	..	35	10	—1	+20	Dy.
*Hopkinsville	5.8	6	5	6	5	4½	5	25	30	10	—10	+50	Dy.
*Lexington	21.6	5	5	5	1	..	..	9	25	10	—25	+1,500	Dy.
Louisville	161.1	8	3	2½	1	4¼	..	..	15	Sl	—5	...	Dy.
Ludlow	2.5	Meter system.						6	25	14	—1	+100	Dy.
Morganfield	1.1	6	..	3	..	4	7	..	35	10	—1	+20	Dy.
Newport	24.9	..	..	..	..	..	..	..	10	7	...	...	..
*Owensboro	9.8	9	5	5	4	6	13	..	35	Sl	—1	...	Dy.
*Paris	4.2	6	4	4	2	5	6	15	25	10	—1	+20	Dy.
*Shelbyville	2.7	7	4	4	2	5	5	14	30	10	—1	+20	Dy.
*Somerset	2.6	8	6	5	3	..	..	..	35	15	—25	+500	Mo.
*Stanford	1.4	6	..	4	..	..	5	..	..	..	...	...	..
*Winchester	4.5	8	4	4	..	5	6	15	25	16	—1	+20	Dy.
OHIO.													
*Akron	27.6	7	2½	2½	..	0	..	..	15	8	—375	+3,000	..
Arlington Hts.	0.2	4	2½	2	1½	2	5½	..	40	10	¼	+25	Dy.
Ashland	..	4½	3	3	3	3	5	..	20	8	¼	+5	Dy.
Athens	2.6	5	3	3	0	3	5	..	30	8	0.1	+10	Dy.
Bellaire	9.9	8	2	3¼	..	..	..	..	..	..	...	...	..
Bellefontaine	4.2	4	2	2	0	3	..	..	15	3	—1	+150	Dy.
Bryan	3.1	4	3	2	..	2	..	..	..	..	...	...	..
*Bucyrus	6.0	7	3	3	½	2	5	12	25	Sp	—1	...	Dy.
Canal Dover	3.5	7	2	3	½	2	2	..	20	6	½	+10	Dy.
Carey	1.6	6	3	2½	..	2	0	..	30	15	0.1	+4	Dy.
Carrollton	1.2	5	..	..	..	2	0	..	..	..	...	...	..
Carthage	2.3	6	2½	2	2	2½	..	..	40	8	—½	+25	Dy.
Cincinnati	305.9	6½	..	2¾	1	2¾	..	..	20	8	—15	+638	Mo.
*Circleville	6.6	7½	2	..	..	2½	..	..	30	15	0.1	+4	Dy.
Cleveland	270.0	5½	2	2	..	..	0	10	5	5	F	F	..
Columbiana	1.1	5	..	2	..	3	3	..	..	..	...	...	..
Coshocton	3.7	7	2	3	½	2	3	..	25	8	—½	+4	Dy.
Continental	0.9	6	3	2	0	3	4	..	15	15	F	F	..
Dayton	61.2	5	2½	2	2	2½	..	..	8	7	—250	+250	Qr.
*Defiance	7.7	8	3	5	1	2½	5	..	40	Sl	10	...	Mo.
*Delaware	8.2	7	3	3	..	3	37	5	25	Sp	—1	...	Dy.
*Dennison	2.9	6½	5	3½	1	3	5	5	35	15	0.1	+10	Dy.
East Liverpool	11.0	8	3	3½	..	3½	..	6	30	5	...	...	..
Eaton	2.9	5	2½	2½	½	3	M	7	20	13	0.1	+2	Dy.
*Elyria	5.6	8	3	3	..	1½	5	..	15	8	—375	+3,000	..
Findlay	18.6	5	3	3	1	3	4	..	12	6	—½	+3	Dy.
Fostoria	7.1	Meter system in use.						5	20	Sl	25	...	..
Franklin	2.7	3	2½	3	1	2	5	..	15	8	40	2,000	Qr.
Fremont	7.1	6	2	3	0	2	0	..	25	Sp	0.1	...	Dy.
*Galion	6.3	8	4	4	1½	3	6	10	25	Sl	10	...	Qr.
Greenville	5.5	4	2	3	..	1½	5	7	8	8	F	F	..
Hartwell	1.5	5½	2½	2	1	2¼	3½	25	15	8	...	+25	Dy.
Hillsboro	3.6	5½	2½	2½	..	2½	..	..	30	10	0.1	...	Dy.
Ironton	10.9	8½	5	3	..	4	..	..	..	..	...	...	..
*Kent	3.5	6¼	2½	2½	1½	..	..	..	15	9	—375	+2,250	Mo.
Lebanon	3.1	3¾	2½	3	1	1½	..	3	25	..	—½	...	Dy.
Leetonia	2.8	6	3	3	..	2	4	..	15	..	—250	...	..
Logan	3.1	4	2	3	0	2	8	..	30	8	0.1	+20	Dy.
*London	3.3	6¾	3	3	..	2½	5½	..	25	16	½	+6	Dy.
Madisonville	2.2	6	2½	2	1	2½	3	..	40	8	—¼	+25	Dy.
Mansfield	13.5	5	3	3	0	3	..	5	25	6	—½	+180	Dy.
Martin's Ferry	6.3	9	3½	3½	1	..	7½	..	30	10	—½	+3	Dy.

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City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year.						Meter Rates.					
		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $.	Price per 1,000 galls., cts.		Quantity at each price, 1=1,000 galls.		
									Max.	Min.	At max. price.	At min. price.	Period.
*Marysville	2.8	6	8	8	..	8	5	5	25	Sp	—1	...	Dy.
*Massillon	10.1	7¼	3	2¾	..	2½	3	..	25	15	0.1	+4	Dy.
Millersburg	1.9	3	2	2	½	2½	3	3	20	8	0.1	+5	Dy.
Minerva	1.1	5	..	2½	..	..	..	No meters in use.					
Mt. Sterling	0.8	5	..	3	..	..	3	..	25	20	0.1	+½	Dy.
Mt. Vernon	6.0	6½	2	2	0	2	4	..	20	15	0.1	+1	Dy.
Napoleon	2.8	4	2½	4	0	2	5	..	15	10	—1	+2	Dy.
Niles	4.3	8	3	3½	..	3	..	..	40	10	0.1	+10	Dy.
Norwood	0.8	5½	2½	2	1	3	3	..	40	8	—¼	+25	Dy.
Oberlin	4.4	5	3	3	..	3	7½	..	30	20	—½	+1	Dy.
Orrville	1.8	4	2	2½	..	..	3	..	6	6	F	F	..
Oxford	1.9	4	2	2	1	3	5	7	30	11	0.1	+2	Dy.
Painesville	4.8	8	4	4	4	5	Sp	..	30	13	½	+20	Dy.
Piqua	9.1	2	2	2	2	1	3	..	..	..	...	...	..
Port Clinton	2.0	4	2	2	0	2	6½	..	..	..	...	...	..
Ravenna	3.4	5	2	2	0	2	2	..	15	5	...	...	..
Reading	3.6	5½	2½	2	2	1½	..	..	30	8	—¼	+25	Dy.
Ripley	2.5	7	2½	2½	1	3	8	..	20	Sl	5	...	Mo.
*Salem	5.8	5	1	3	1	2¼	5	..	30	8	0.1	+20	Dy.
Sandusky	18.5	8	2½	3	..	3	7½	5	15	4	0.1	+20	Dy.
*Shelby	2.0	8	4	4	1	3	..	10	25	Sl	10	...	Qr.
Springfield	31.9	5	2½	2½	2	2	7	..	10	10	F	F	..
Steubenville	13.4	8	4	2	1	2	..	..	..	..	...	...	..
Toledo	81.4	5	3	3	0	3	7½	6	10	4	—2	+170	Dy.
Toronto	2.5	7	3	4	..	3½	..	..	..	..	...	...	..
Troy	4.5	5	2	2½	2	3	..	..	..	..	...	...	..
Van Wert	5.5	5	3	3	..	2½	5	..	30	7	—½	+25	Dy.
*Wadsworth	1.6	8	2½	1	..	..	..	..	..	..	...	...	..
Wapakoneta	3.6	5	2	2	0	1	3	10	10	10	F	F	..
*Warren	6.0	9	3½	4	..	3	7½	..	35	10	0.1	+10	Dy.
Willoughby	1.2	6½	..	2	..	2	3	..	..	..	...	...	..
Wyoming	1.5	5½	2½	2	2	3	4	..	40	8	—¼	+25	Dy.
*Xenia	7.3	6¾	3	3	..	2½	5½	..	..	..	...	...	..
Youngstown	33.2	8¾	3½	3½	..	3½	5	..	20	8	250	+1,000	..
Zanesville	21.0	9	5	1	2½	2	..	..	..	..	...	...	..
INDIANA.													
Albion	1.2	7	2	3	1	1	0	..	..	..	...	...	..
Alexandria	0.7	4	1½	2	½	1	6	..	..	..	...	...	..
Anderson	10.7	5	..	2	½	2	2	..	..	..	...	...	..
*Angola	1.8	3	1½	2	1½	1½	2	..	30	10	0.1	+4	Dy.
Columbia City	3.0	2	2	2	1	1	3	..	..	..	...	...	..
Connersville	4.5	3	1½	2	1½	2	3	..	..	..	...	...	..
Converse	..	3	1	1	0	..	..	..	..	..	...	...	..
Crown Point	1.9	5	2	2	½	2	3½	..	15	5	0.1	Sp	Dy.
Danville	1.6	6	..	..	..	2	5	..	25	8	—½	+10	Dy.
East Chicago	1.3	8½	2	2	1	..	..	..	10	Sl	—165	...	Mo.
*Elwood	2.3	7½	5	5	2	3	..	..	..	25	0.1	...	Dy.
Evansville	50.8	7½	4	4	1	4	..	..	..	..	...	...	..
Fort Wayne	35.4	5½	2½	3½	0	2	5	..	10	Sl	1	...	Dy.
*Greencastle	4.4	7½	5	5	4	3	5	..	40	15	0.1	+10	Dy.
*Greensburgh	3.6	8¼	3	3½	1	3	7½	..	35	15	0.1	+4	Dy.
*Houghville	2.1	6	3	3	..	10	..	20	20	5	—½	Sp	Dy.
Huntington	7.3	6	2	2	0	1	..	..	25	10	0.1	+2	Dy.
*Indianapolis	105.4	6	3	3	..	10	..	20	20	5	—½	Sp	Dy.
Jasper	1.3	4	..	..	..	2	4	..	..	..	...	...	..
Kentland	0.9	5	1	2	0	..	..	..	..	..	...	...	..
Lafayette	16.2	7½	2½	3½	0	3	7½	..	20	Sl	15	...	..
Logansport	13.3	4	2	1½	½	2	4½	..	20	Sp	0.1	...	Dy.
Marion	8.8	4	3	2	½	..	2	..	..	..	...	...	..
Middletown	0.9	..	..	2	..	2	3	..	..	..	...	...	..
*Mt. Jackson	0.3	6	3	3	..	10	..	20	20	5	—½	Sp	Dy.
*Mt. Vernon	4.7	8	3	4	..	2	..	..	50	20	0.1	+10	Dy.
Nappannee	1.5	4	2	2	1½	2	3	..	40	Sp	—0.2	...	Dy.
*New Albany	21.1	7	2	3	..	4	16	24	15	5	¼	150	Dy.
New Castle	2.7	..	1½	2	½	1½	..	5	10	8	.1	+1	Dy.
*Noblesville	3.1	6½	5	5	0	3	5	..	160	60	0.1	+10	Dy.
Paoli	0.7	5	3	3	..	1½	2½	..	..	..	...	...	..
Peru	7.0	6½	2	2	0	2	4	..	20	15	0.1	...	Dy.
Plymouth	2.7	3	2	2	..	1	3½	..	..	..	...	...	..
Portland	3.7	4	3	4	2	3½	4	..	25	7	—½	+30	Dy.
*Richmond	16.6	..	3	..	½	4¼	4	..	25	6	—0.12	+75	Dy.
*Seymour	5.3	7¼	3½	3	..	10	8	..	40	Sp	0.1	...	Dy.

* Private ownership. M = By meter, only. Sp = Special. Sl = Sliding scale (see p. i.).
F = Flat rate. — = Less than. + = More than (see p. i.).

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FULLER IRON WORKS

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FLANGE PIPE AND FITTINGS FOR **STEAM** PLANTS.
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OFFICE 40 TOCKWOTTON ST., COR. SOUTH MAIN.

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MONTREAL PIPE FOUNDRY CO., Ltd.,

Successors to Drummond, McCall Pipe Foundry Co., Ltd.,

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CAST IRON WATER AND GAS PIPES

SPECIAL CASTINGS.

HYDRANTS, VALVES AND WATER-WORKS SUPPLIES

Offices, Canada Life Bldg., MONTREAL, CANADA.

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	At min. price.	Period.
South Bend.....	21.8	4½	2	3	1½	..	3	..	10	S1	—80	...	..
Vevay	1.7	4½	2	2	½	1	1½	..	..	..	...	...	..
*Vincennes	8.9	6½	5	5	3	9	..	..	50	15	0.1	+10	Dy.
*Wabash	5.1	8	3	4	..	2	5	..	40	20	...	...	..
*Washington	6.1	9	4	4	0	4	5	..	50	20	0.1	+5	Dy.
*West Lafayette..	1.2	10	4	4	..	5	6	25	30	Sp	0.1	...	Dy.
MICHIGAN.													
Allegan	2.7	4	1½	2	..	..	..	..	40	20	0.1	+5	Dy.
*Alpena	11.3	7	3	2	..	2	5	..	..	..	...	...	..
*Ann Arbor.....	9.4	8¾	3½	4	..	3	7½	40	15	10	...	...	..
Bad Axe.....	0.8	4	2	3	..	2	5½	..	25	25	F	F	..
Battle Creek.....	13.2	4	3	2	..	3	4	8	13	7	0.1	+70	Dy.
Bay City.....	27.8	8	3	3	..	3	7½	6	10	Sp	—10	+30	Dy.
Benton Harbor...	3.7	4	2	2	..	2	4	..	40	15	—½	+60	Dy.
Big Rapids	5.3	4	3	..	..	4	4	No meters in use.					
*Cadillac	4.5	6	2¼	2	..	2½	3½	..	40	15	0.1	+10	Dy.
*Cairo	1.7	9	4	6	..	4	6	..	50	12	0.1	+20	Dy.
Carson City.....	0.9	4	..	..	..	3	5	..	..	..	...	...	..
Cedar Springs....	1.0	4	..	1	..	2	2	..	..	..	...	...	..
Cheboygan	6.2	5½	3	2	..	2	5	..	..	..	...	...	..
Chesaning	1.1	5	..	2	..	2	5	..	..	..	...	...	..
Coldwater	5.2	5	2½	2	2	2	2	..	10	5	0.3	+1	Dy.
Detroit	205.9	5	3	2	1	..	0	..	7	S1	22½	...	Mo.
Dowagiac	2.8	4	2½	2	..	2	3	..	15	12	½	+½	Dy.
Evart	1.3	5	2	1	..	2	4	..	..	..	...	...	..
*Flint	9.8	Practically meter system.						5	25	25	F	F	..
*Frankfort	1.2	7½	2	5	..	3	0	..	40	20	—½	+8	Dy.
Grand Haven ...	5.0	4	1	1½	..	..	4	..	..	..	...	...	..
*Grand Haven ..	5.0	6	3	4	..	3	10	6	25	10	0.1	+4	Dy.
Grand Rapids.....	60.3	5	4½	2½	..	..	15	5	20	5	—¾	+37½	Dy.
*Grand Rapids ..	60.3	5	4½	2½	..	..	15	5	20	5	—¾	+22½	Dy.
Greenville	3.1	5½	2½	5	0	5	4½	..	..	..	...	...	..
Holly	1.3	2½	3	..	..	1	3	..	..	..	...	...	..
Howell	2.4	5	2½	2	0	2	3	..	25	8	½	+10	Dy.
Imlay City.....	1.3	4	3	2½	½	2	4	..	25	8	0.1	+4	Dy.
Ionia	4.5	4	3	2	..	..	4	..	..	..	...	...	..
*Iron Mountain...	8.6	6½	..	4	2	1	5	..	30	8	0.1	+10	Dy.
*Ironwood	7.7	14½	7	5	0	7	Sp	..	40	S1	3	...	Dy.
L'Anse	0.7	6	3	3	..	..	5	..	..	..	...	...	..
Lansing	13.1	5½	2½	2½	0	2	4¼	..	40	S1	1	...	Mo.
*Ludington	7.5	9¾	3	2	1½	..	6	..	25	S1	1	...	Dy.
*Manistee	12.8	8	3	3	1½	8	..	12	30	Sp	—½	...	Dy.
Manton	0.7	4¼	2½	1	..	2	4½	..	25	8	0.1	+4	Dy.
Marlette	0.9	4	2	1	..	2	2	..	25	10	0.1	+2	Dy.
Marquette	9.1	8	3	5	..	3	7	..	20	6	...	...	..
Mason	1.9	4	2½	2	..	2	2	..	25	5	0.1	+20	Dy.
*Menominee	10.6	9	3	3	1	2	5	8	20	S1	10	...	Qr.
*Monroe	5.3	7	2	3½	..	2	6½	..	30	Sp	—½	...	Dy.
Mt. Clemens	4.7	4	2½	2	0	2	3	..	15	8	—1	+4	Dy.
Negaunee	6.1	7	3	3	..	..	3	..	..	..	...	...	..
Niles	4.2	3	2	2	½	1	..	..	20	Sp	0.1	...	Dy.
Owosso	6.6	4	4	2	..	1½	4	4	15	S1	½	...	Dy.
Petoskey	2.9	4	2	2	..	2	3	10	9	6	0.1	+4	Dy.
Plymouth	1.2	4	2½	2	..	2	2	..	40	35	½	+½	Dy.
Port Huron.....	13.5	7	3	2½	1	..	7	10	10	S1	25	...	Mo.
Richmond	1.1	4	..	..	..	1	2	..	20	20	+½	—1	Dy.
Rochester	0.9	3	Sp	..	..	1½	2	..	..	..	...	...	..
Saginaw	46.3	8	3	2½	0	4	3	10	11	6	—5	...	Dy.
St. Ignace.....	2.7	6	2	2	0	2	4	..	25	8	0.1	+4	Dy.
Tecumseh	2.3	4	2½	2	1½	2	3	..	35	25	—0.1	+½	Dy.
*Traverse City....	4.4	7	2	2	1	4	2½	..	40	S1	—½	...	Dy.
Trenton	0.8	6	0	0	0	..	1	..	..	..	...	...	..
Union City.....	1.2	3	2½	2	..	1	1½	..	40	20	0.1	+5	Dy.
Vassar	1.7	5	2½	2½	0	2	4	..	25	8	0.1	+4	Dy.
Whitehall	1.9	4	1	1	..	2	3	16	20	20	F	F	..
Wyandotte	3.8	4	2½	2	1	2	3	..	8	8	F	F	..
Ypsilanti	6.1	5	2½	2	2	3	3	..	40	25	½	+10	Dy.
ILLINOIS.													
Aledo	1.6	4	..	1	..	2	2	..	35	35	F	F	..
*Alton	10.3	8	5	8	..	8	25	..	50	25	...	...	..
Aurora	19.7	4	..	2	0	1½	3½	6	30	S1	—3¼	...	Qr.
*Belleville	15.4	7	4	6	3	4	3½	..	50	Sp	0.1	...	Dy.

* Private ownership. M = By meter, only. Sp = Special. S1 = Sliding scale (see p. 1.).
F = Flat rate. — = Less than. + = More than (see p. 1.).

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IRON, BRASS MOUNTED.

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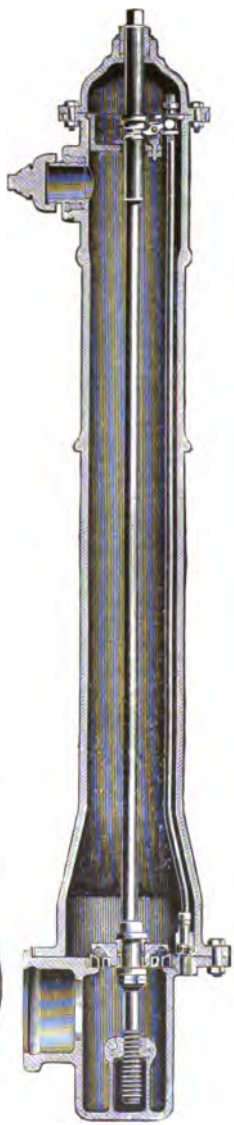
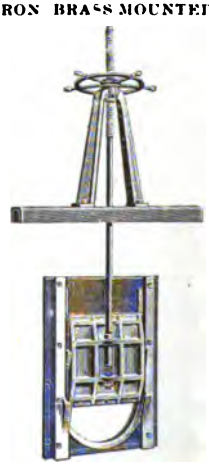


6-IN.
IRON, BRASS MOUNTED.

SCREW ENDS.

IRON BRASS MOUNTED.



SLUICE GATE AND STAND.

Specifications for Bids Solicited,
And Estimates of Cost Given on Application.

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year.						Meter Rates.					
		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $.	Price per 1,000 galls., cts.		Quantity at each price, 1=1,000 galls.		
									Max.	Min.	At max. price.	At min. price.	Period.
Belvidere	8.9	5	2½	0	..	5	5	..	40	20	0.3	+5	Dy.
*Cairo	10.3	8	5	5	..	8	2	12	30	10	—0.1	...	Dy.
*Carlinville	3.3	7	5	5	2½	7	5	..	50	18	1	+10	Dy.
Carlyle	1.8	6	4	4	2	4	5	..	30	10	0.1	+30	Dy.
Chicago Heights	..	9	0	0	0	..	3	..	10	8	—165	+165	Mo.
*Chillicothe	1.6	6½	3	3	..	2	6	..	50	S1	—1	...	Dy.
Clinton	2.6	4	2	2	..	2	4	..	25	..	0.3	...	Dy.
Decatur	16.8	6	2½	3	..	3	7	8	10	7	—1,000	+2,500	Yr.
De Kalb	2.6	6	3	2	1	2	M	..	40	20	0.3	+1	Dy.
Downer's Grove	1.0	7	2	2	¼	..	3	..	35	Sp	—0.1	...	Dy.
Dundee	2.0	6½	2½	1	..	2	3¾	6	20	10	—0.1	+5	Dy.
Earlville	1.1	6½	2½	2½	..	2	3¾	6	35	10	—0.1	+5	Dy.
East Dubuque	1.1	4	2½	2½	..	3	4	..	25	Sp	0.1	...	Dy.
*East St. Louis	15.2	7	5	5	..	5	5	..	30	10	1	+27.4	Dy.
*Effingham	3.3	8	5	5	..	3	7½	..	50	20	0.1	+5	Dy.
Elgin	17.8	6	2½	0	..	3	3¾	..	..	..	...	...	..
Elmwood	1.5	4	2½	..	1	2	4	..	40	10	0.3	+6	Dy.
Forreston	1.1	3¼	..	2	..	..	3	..	Sp	Sp	...	...	..
*Freeport	10.2	9¼	2½	3½	1	3	7½	..	35	10	0.1	+6	Dy.
*Galena	5.6	8¼	2½	3½	..	3	5	..	50	15	0.1	+10	Dy.
Galesburg	15.3	Meter system in use.						..	25	S1	—3	...	Dy.
Galva	2.4	4½	1½	2	½	1	2	..	20	10	0.3	+5	Dy.
*Harvey	..	8	3	3	0	3	5	5	20	8	0.01	Sp	Dy.
Highland Park	2.2	7½	6	3¾	..	2¼	..	..	18	10	—100	+1,000	Yr.
Hillsboro	2.5	4	..	..	..	3	4	..	..	..	...	...	..
Hoopestown	1.9	7	..	..	..	M	M	7	50	15	—0.3	+5	Dy.
*Kankakee	9.0	8	2½	4½	0	3	5	..	35	15	0.1	+5	Dy.
Kewanee	4.6	5	4	3	2	4	5	..	..	..	...	...	..
Knoxville	1.7	4	2	2	1	2	2	..	30	18	0.3	+5	Dy.
*La Grange	2.3	Meter system in use.						5	27	S1	9	...	Qr.
*Lake Forest	1.2	..	3	3	3	3	10	..	50	20	—0.3	+10	Dy.
Lexington	1.2	6	3	..	1	2	6	No meters in use.					
*Lincoln	6.7	7¼	3	4	3	3	4	..	30	16	0.1	+30	Dy.
Maywood	2.1	4½	2	..	1	¾	2	..	20	20	F	F	..
Minonk	2.3	4½	..	2	..	2	..	..	35	15	0.4	+5	Dy.
Moline	12.0	6¾	2	2	..	2	0	..	15	6	10	+80	Mo.
Monmouth	5.9	5½	2½	3	1	2	4	..	35	15	0.3	+5	Dy.
Monticello	1.6	4	2	1	..	2	2	8	..	..	...	...	..
Mt. Pulaski	1.4	6	3	3	..	2	5	..	40	Sp	—0.1	+5	Dy.
*Mt. Vernon	3.2	10	4	4	0	3	16	..	50	18	1	+10	Dy.
Nokomis	1.3	5	2	4	1	3	4	3¾	50	12	0.1	+10	Dy.
*Oak Park	4.8	10	3	3	0	2	6	..	30	25	—1	+1	Dy.
Ohio	0.4	5	2	2	0	3	3	..	..	..	...	...	..
Oregon	1.6	6	..	3	..	4	..	..	40	12	0.1	+10	Dy.
Ottawa	10.0	6	2½	2½	0	2	5	..	..	..	...	...	..
Pana	5.1	6	2	2	..	2	3	..	35	10	0.1	+20	Dy.
*Peoria	41.0	8	3	3	..	2	5	3	20	S1	—1	+1	Dy.
Peru	5.6	4¾	3	2¼	1½	2	4	..	..	..	...	...	..
*Quincy	31.5	5½	4	3¾	0	2¾	6½	13½	23	45	S1	...	..
River Forest	..	6¾	3	3	..	..	5	..	18	18	F	F	..
Rockford	23.6	7	2½	3	..	3	5	..	20	12	0.3	+5	Dy.
Rock Island	13.6	8	2	3	..	2	3	20	20	S1	40	...	Qr.
Sheffield	1.0	5	2	2	0	1¾	3	..	..	..	...	...	..
Springfield	25.0	5	3	3	3	..	..	..	20	8	—25	...	Mo.
*Sterling	5.8	8	4	4	..	3	4	10	25	25	F	F	..
*Streator	11.4	9¼	2½	3½	..	3	7½	..	50	15	0.1	+10	Dy.
Waukegan	4.9	5	2	..	..	1	3	..	30	5	—5	+60	Mo.
West Dundee	0.9	6	2½	1	..	2	3¼	..	15	10	3	+5	Dy.
Western Springs	0.5	7½	3	3	1	1½	4	..	20	Sp	—10	...	Mo.
Wheaton	1.6	5	2	0	..	1	2½	..	10	10	F	F	..
Winnetka	1.1	4	1¾	3½	..	1¼	4	..	24	8	0.1	+10	Dy.
Yorkville	0.4	5	..	..	..	..	..	..	13	13	F	F	..
WISCONSIN.													
*Ashland	10.0	11¼	4	5	..	5	5	12	30	13	—1	+20	Dy.
*Beloit	6.3	10	4	5	0	4	6	10	35	10	Dom.	Sp	..
Black River Falls	2.3	7	3	1	..	..	5	..	30	10	—0.2	+4½	Dy.
Centralia	1.4	6½	4	4	2	2½	5	24	35	13	0.1	+30	Dy.
Columbus	2.0	7	4	2	0	3	5	5	40	11	—45	+450	½ yr.
*Eau Claire	17.4	8¼	4	4	0	4	5	..	30	10	0.1	+30	Dy.
Elkhorn	1.4	4½	2½	2½	..	1¾	3	5	15	9	—1	+7	Dy.
*Green Bay	9.1	8	4	4	2	..	6	..	40	S1	2	..	Dy.
Hayward	1.3	6	4¾	6	0	4¾	5	..	30	10	—1	+30	Dy.
Kenosha	6.5	5	3	3	..	3	5	..	25	Sp	0.3	+10	Dy.

* Private ownership. M = By meter, only. Sp = Special. S1 = Sliding scale (see p. i.).
F = Flat rate. — = Less than. + = More than (see p. i.).

GEORGE I. ROCKWOOD, C. E.

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City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each price, 1=1,000 galls. At max. price.	At min. price.	Period.
La Crosse	25.1	7	3	3	0	3	5	..	40	Sl	—1	...	Dy.
Lake Mills	1.1	6½	3	3	1	2	6	..	50	20	—0.3	+5	Dy.
Lancaster	1.5	6	3	3	..	2½	5	..	30	30	F	F	..
Lodi	0.7	4	..	1	1	2	..	..	..	..	...	...	..
Madison	13.4	6	2½	3	0	2	..	..	27	Sl	37½	...	½ yr.
Milwaukee	204.5	8	2	3	1	7	9	..	..	..	...	...	..
*Monroe	3.8	10	4	5	2	4	6	10	50	13	0.1	+30	Dy.
Neenah	5.1	7	3	0	0	3	..	..	..	..	...	...	..
*Oconto	5.2	8	5	..	..	4	11	..	50	20	0.1	+10	Dy.
Onalaska	1.6	4½	2	2	0	1¾	2	..	..	..	...	...	..
*Oshkosh	22.8	8	5	4	..	4	11	15	40	Sp	—5	+50	Mo.
Phillips	0.8	3	3	3	1	4	5	..	..	..	...	...	..
Platteville	2.7	5	Sp	1½	..	..	..	10	30	6	—1	+30	Dy.
*Portage	5.1	8	4	4	2	4	5	..	30	10	0.1	+30	Dy.
*Racine	21.0	4¾	4	3½	1¾	2½	4¾	10	?0	6	—1	+?0	Dy.
Reedsburg	1.7	4	2	2	..	2	3	..	15	6	0.1	+1	Dy.
*Rice Lake	2.1	7½	4	4	2	4	5	..	30	15	0.1	+30	Dy.
Richland Center	1.8	5	2½	3	0	3	..	5	20	12	0.1	+0.6	Dy.
River Falls	1.1	5	2	2	..	2	3	..	20	Sp	—10	+20	Mo.
Shullsburg	1.4	5½	2½	2	0	2	..	..	50	20	—0.3	+5	Dy.
Sparta	1.0	5¼	1½	1½	0	2	2½	..	15	Sp	—1	+10	Dy.
*Stevens Point	7.9	8	4	4	2	4	5	..	35	13	0.1	+30	Dy.
*Superior	12.0	8	4	4	3¾	..	14	..	40	16	0.1	+10	Dy.
Tomah	2.2	6	2½	1	0	2	5	..	50	20	—0.3	+5	Dy.
*Washburn	3.1	14	5	5	..	4½	..	..	..	..	...	...	..
Watertown	0.9	5½	2½	3	..	3	5	..	35	10	0.1	+20	Dy.
*Waukesha	6.3	8	4	4	..	4	6	..	40	Sl	2	...	Dy.
IOWA.													
Ackley	1.3	6	3	2	0	5	3	..	40	20	—½	+1	Dy.
Alton	0.7	5	..	0	0	3	3	..	40	20	0.1	+1	Dy.
Atlantic	4.4	6	3	3	..	..	10	12	40	20	—1	+5	Dy.
Audubon	1.3	4	3	..	..	5	M	..	40	40	F	F	..
Bellevue	1.4	6	3	2	0	..	4	..	40	25	...	...	..
Belmond	0.8	2	Sp	1	0	1	2	..	40	20	—½	+1	Dy.
Boone	6.5	Meter system in use.						..	40	Sl	1	...	Mo.
*Burlington	22.6	9	4	5	..	5	Sp	..	40	10	—1	+10	Dy.
*Cedar Rapids	18 0	8	5	5	0	3	4	..	40	10	0.1	+1	Dy.
Centerville	3.7	4½	3	..	0	1½	2	..	50	15	0.1	+4	Dy.
Cherokee	3.4	6	3	0	0	3	3	..	Sp	Sp	...	...	..
Clarksville	0.7	5¾	3	3	..	3	6	..	40	Sp	0.1	+4	Dy.
*Clinton	19.4	8	3	5	..	2	5½	6	30	Sl	—1	...	Dy.
Coon Rapids	0.9	Meter system in use.						5	40	20	—0.2	+2	Dy.
*Creston	7.2	12½	2½	5	0	3	5	10	35	15	0.1	+4	Dy.
*Davenport	26.9	8	5	4	..	3	5	..	40	Sp	20	+250	Mo.
*Des Moines	50.1	6¼	3	3	..	2	7½	4	30	10	—1	+5	Dy.
Eagle Grove	1.9	5	..	3	..	..	..	..	30	10	...	...	..
Eldora	1.6	6	3	3	0	3	4	..	60	Sp	0.1	+5	Dy.
Emmetsburg	1.6	6	3	3	0	3	4	..	40	10	5	+1,000	Mo.
*Fort Madison	7.9	10	4½	5	..	7	5	..	50	20	3	+300	Mo.
Glenwood	1.9	6	..	..	0	..	6½	..	30	20	—100	+100	..
Grinnell	3.3	Meter system in use.						..	40	20	—0.1	+1	Dy.
*Iowa City	7.0	6½	3	3	0	3	7½	..	40	20	0.1	+1	Dy.
Jefferson	1.9	6	2	2	..	1½	..	..	40	25	—0.2	+5	Dy.
Knoxville	2.6	4	2½	2	..	2	Sp	3	20	15	0.1	+½	Dy.
Lake City	1.2	6	3	1	0	3	5	..	40	20	0.3	+1	Dy.
Lisbon	1.1	5	3	0	0	3	3	..	40	20	0.1	+1	Dy.
Logan	0.8	4	..	2	..	2	4	10	30	10	0.1	+4	Dy.
Manchester	2.3	6	2	2½	0	2	3	..	40	20	—0.1	+1	Dy.
*Marcus	0.7	6	..	..	0	3	5	..	40	20	0.1	+1	Dy.
Marengo	1.7	3	1½	¾	0	1	2	..	..	..	...	...	..
Maxwell	0.5	5	3	..	..	2	5	..	35	25	0.1	+1	Dy.
*Muscatine	11.5	10	3	4	..	3	6	..	35	10	—20	+300	Mo.
Oakland	0.7	7½	3	..	..	1	3	..	..	..	...	...	..
Postville	0.9	5	3	2	0	3	5	..	35	15	0.1	+1	Dy.
*Rock Rapids	1.4	5½	..	2½	..	..	Sp	..	20	20	F	F	..
Sheldon	1.5	5	5	3	0	2	5	5	20	20	F	F	..
Shenandoah	2.4	6	2	3	..	3	..	8	20	8	0.1	+10	Dy.
Spencer	1.8	6	3	3	0	3	4	..	40	10	5	+1,000	Mo.
Villisca	1.7	6	4	0	..	2½	..	5	50	25	—0.05	+1	Dy.
Vinton	2.9	5	3	1	0	2	4	..	40	..	Dom.	...	..
Washington	3.2	7½	3	3	0	3	4	..	40	15	0.1	+4	Dy.
Waukon	1.6	5	3	2	0	3	5	..	30	15	0.1	+1	Dy.
West Bend	0.3	6	3	0	0	3	2½	..	40	20	0.1	+1	Dy.

* Private ownership. M = By meter, only. Sp = Special. Sl = Sliding scale (see p. 1.). F = Flat rate. — = Less than. + = More than (see p. 1.).

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City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year.						Meter Rates.					
		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $	Price per 1,000 galls., cts. Max.	Price per 1,000 galls., cts. Min.	Quantity at each price, 1—1,000 galls. At max. price.	Quantity at each price, 1—1,000 galls. At min. price.	Period.
West Liberty	1.3	6	3	2	0	..	3	..	20	18	...	...	..
Williams	0.7	4	3	3	0	2	2	..	40	10	0.1	+4	Dy.
MINNESOTA.													
Alexandria	2.1	5	3	2	0	2	5	..	25	25	F	F	..
Brownton	0.4	5	2	2	..	1	1½	5	15	6	—1	+18	Dy.
Caledonia	0.9	6	..	2	..	1	3	..	..	..	...	...	..
*Crookston	3.5	12	5	5	..	5	16	..	50	10	0.1	...	Dy.
*Fergus Falls ...	3.8	12	5	5	4	5	16	..	50	20	0.1	+10	Dy.
Grand Rapids ...	0.3	5	3	3	..	2	5	..	50	Sp	—0.3	+10	Dy.
Howard Lake ...	0.6	5	0	0	0	5	5	..	40	40	F	F	..
Hutchinson	1.4	5	2	2	..	1	2	5	15	6	—1	+18	Dy.
Jackson	0.7	6	3	3	..	1	3	6	50	Sp	—0.3	+10	Dy.
Lake Benton	0.5	6	3	3	..	2	6	5	50	Sp	—0.3	+10	Dy.
Lake City	2.1	5	3	3	1	3	6¼	..	40	11	—0.3	+4	Dy.
Mankato	8.8	5	3	2	..	1	2	6	20	Sl	—30	...	Mo.
New Prague	1.0	5	3	3	2	2	5	..	50	Sp	—0.3	+10	Dy.
New Ulm	3.7	6	3	2½	1	2	M	5	40	20	—0.05	+½	Dy.
Northfield	2.7	6	3	3	2	2	5	..	50	Sp	—0.3	+10	Dy.
Owatonna	3.8	5	3	3	..	2	3	..	20	Sp	—½	+10	Dy.
Red Wing	6.3	5	3	3	0	5	6¼	..	30	8	—9	+750	Mo.
St. Charles	1.2	3	2	2	..	1	4	..	..	..	...	...	..
*St. Cloud	7.7	9	4	4	2	4	5	..	30	10	0.1	+30	Dy.
St. James	0.9	6	3	3	..	1	3	6	50	Sp	—0.3	+10	Dy.
St. Paul	133.2	5	2	2	0	2	3	..	16	8	—22½	+120	..
Sauk Centre	1.7	5	..	3	..	2	5	..	..	..	...	...	..
Spring Grove	0.4	6	..	2	..	1	3	..	..	..	...	...	..
Wells	1.2	5	2	2	..	2	5½	..	30	20	0.1	+1	Dy.
Wilmar	1.8	4	2	1½	..	1½	2	..	..	..	...	...	..
Windom	0.8	6½	2½	3	1	2	5	..	50	Sp	—0.3	+10	Dy.
Winona	18.2	3	3	3	½	1	5	..	20	Sl	5	...	Mo.
Worthington	1.2	6	3	3	..	1	3	6	50	Sp	—0.3	+10	Dy.
Zumbrota	0.9	5	3	3	0	5	6¼	..	30	8	—9	+750	Mo.
KANSAS.													
*Atchison	14.0	7	5	5	..	7	..	..	50	20	2	+20	Dy.
Chanute	2.8	6	2	2	..	2½	5	..	45	10	—2	+150	Mo.
*Cherryvale	2.1	6½	3	3	..	1½	6	..	..	..	...	...	..
Coffeyville	2.3	7	1	2	..	2	4	..	20	8	—0.01	+10	Dy.
*Columbus	2.2	12	5	5	..	4	..	..	..	..	...	...	..
*Council Grove ..	2.2	7	5	5	..	5	5	..	30	10	—1	+100	Dy.
*Eldorado	3.3	8	3	3	..	..	7½	..	50	..	...	...	..
Ellsworth	1.6	5	2	0	0	3	..	10	30	10	0.1	+4	Dy.
Emporia	7.6	7½	2½	..	..	2	5	6	30	13	—25	+20	Yr.
Enterprise	0.8	5	..	1	..	1	4	..	..	..	...	...	..
*Florence	1.2	7	3	5	..	7	7½	..	30	13	—5	+30	Dy.
Greenleaf	0.9	7	3	4	..	2	6	..	50	Sp	1	+5	Dy.
Hiawatha	2.5	Meter system in use.						..	30	Sp	—½	+30	Dy.
*Hutchinson	8.7	7	3	5	..	7	7	3	30	10	—5	+150	Mo.
Junction City ...	4.5	6	1	2	..	1	5	..	20	7	0.1	+50	Dy.
*Kansas City	38.3	8	4½	4	..	5½	8½	3	25	9	—25	+500	Mo.
*Larned	1.9	6½	..	2½	..	1½	9	..	20	..	10	...	Dy.
*Lawrence	10.0	7	2	2	..	1	15	..	35	15	0.01	+4	Dy.
*Leavenworth ...	19.8	12	5	5	..	12	33	6	50	20	0.1	+8	Dy.
*McPherson	3.2	7	5	4	..	..	..	..	35	20	—5	+10	Mo.
Manhattan	3.0	6	5	3	..	1	5	..	20	13	...	...	..
Osborne	1.2	6	..	0	0	3	6	..	30	10	0.1	+4	Dy.
*Ottawa	6.2	7	2	5	..	2	5	..	50	20	0.1	+10	Dy.
*Paola	2.9	9	5	6	..	4	5	..	25	Sp	0.1	+5	Dy.
*Parsons	6.7	10	3	2	..	3	10	..	30	10	—1	+100	Dy.
Seneca	2.0	Meter system in use.						..	40	Sp	—1	+300	Mo.
Smith Center	0.8	10	..	0	0	..	..	12	45	20	3	+10	½ yr.
*Topeka	31.0	7	3	5	..	7	7½	..	50	13	0.1	+30	Dy.
NEBRASKA.													
Ainsworth	0.7	5	2½	3	..	2	3	10	35	15	0.1	+4	Dy.
Ashland	1.6	6	2½	3	..	2½	4	10	35	15	0.1	+4	Dy.
*Broken Bow ...	1.6	10	5	5	1	4	6	..	40	40	F	F	..
Columbus	3.1	5	3	1½	..	1½	3½	10	25	11	0.1	+4	Dy.
Friend	1.3	7½	2½	3	..	2	3	10	35	15	0.1	+4	Dy.
Fullerton	1.0	6	2½	1½	..	2	7	10	35	15	0.1	+4	Dy.
Geneva	1.6	5	1½	..	..	2	2½	No meters in use.					
Grand Island	7.5	7½	2½	2	1	2	4	..	28	8	0.1	+100	..
Harvard	1.1	6	2	0	0	..	6	..	20	15	0.1	+4	Dy.
Hastings	13.6	6	3	3	..	..	..	..	20	15	...	...	..

* Private ownership. M = By meter. only. Sp = Special. Sl = Sliding scale (see p. i.).
F = Flat rate. — = Less than. + = More than (see p. i.).

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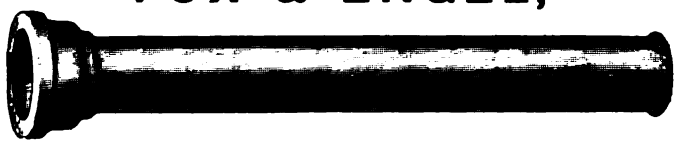

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		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $.	Price per 1,000 galls., cts.		Quantity at each price, 1 = 1,000 galls.		
									Max.	Min.	At max. price.	At min. price.	Period.
Hooper	0.7	5	2½	2	..	2	3	10	35	15	0.1	+4	Dy.
Humbolt	1.1	5½	2½	3	..	2½	3¾	10	35	15	0.1	+4	Dy.
Lincoln	55.2	6	2½	3	0	2½	5	6	15	S1	—6	...	Dy.
*McCook	2.3	14	2½	4	..	3	10	10	90	20	0.1	+4	Dy.
*Nebraska City	11.5	10½	4	4	2	4	10	12	60	18	0.1	+25	Dy.
*Omaha	140.5	8¼	2½	3½	0	3	7½	10	35	10	0.1	+25	Dy.
*Plattsmouth	8.4	8	5	4	..	..	8½	10	35	15	0.1	+4	Dy.
Seward	2.1	6	3	2	..	3	..	6	38	18	4	+50	½ yr.
Stromsburgh	1.4	6	2½	1½	..	1½	6	5	25	8	0.1	+4	Dy.
Superior	1.6	5	2½	3	..	2	5	15	30	Sp	0.1	+4	Dy.
Syracuse	0.7	5	2½	3	..	2½	5	..	35	15	0.1	+4	Dy.
Weeping Water	1.4	6	2½	3	..	2½	4	10	35	Sp	0.1	+4	Dy.
West Point	1.8	5	1½	2	..	2	4	10	25	11	0.1	+4	Dy.
Wilber	1.2	6½	2½	2	..	2	4	10	35	15	0.1	+4	Dy.
SOUTH DAKOTA.													
Flandreau	0.6	6	3	2	..	2	5	..	Sp	Sp	...	...	..
Madison	1.7	5¾	3	3	0	1	5	..	30	20	0.1	+1	Dy.
Mellette	0.2	Water furnished without charge.											
*Sturgis	0.7	10	2	5	3	10	5	..	80	25	0.1	+10	Dy.
Watertown	2.7	7	5	5	1	4	10	8	25	Sp	...	...	..
NORTH DAKOTA.													
Fargo	5.7	13	5	3	3	6	5	..	100	40	0.3	+5	Dy.
Valley City	1.1	5½	3	3	2	..	2½	..	50	20	0.3	+5	Dy.
Wahpeton	1.5	12	5	5	..	5	..	..	50	20	—½	+10	Dy.
WYOMING.													
Buffalo	1.1	24	0	0	0	..	0	..	..	..	...	...	..
Cheyenne	11.7	7	5	5	..	5	5	..	60	30	—½	+10	Dy.
Evanston	2.0	10	5	4	..	..	10	No meters in use.					
MONTANA.													
*Billings	0.8	10	5	5	2	8	7	..	..	..	...	...	..
*Butte City	10.7	20	..	6	..	18	12	10	50	20	—25	+600	Mo.
*Great Falls	4.0	15	4¼	4¼	..	..	8	..	50	Sp	—½	...	Dy.
*Kalispell	2.0	15	12	6	..	18	10	15	50	S1	—1	...	Dy.
*Livingston	2.9	10	5	5	2	8	7½	..	100	100	F	F	..
*Phillipsburg	1.1	18	12	2	..	12	20	..	..	..	...	...	..
MISSOURI.													
*Aurora	3.5	11	..	..	..	..	..	..	25	15	...	...	..
*Clinton	4.7	10	2	3	..	3½	15	..	50	10	—½	+50	Dy.
Glasgow	1.8	9	3	3	..	2	Sp	..	100	20	—1	+200	Qr.
*Holden	2.5	..	..	..	..	..	..	9	40	15	—½	Mfg.	Dy.
Kansas City	119.7	8	4½	5	..	7	9	9	36	S1	—10	...	Mo.
Kirksville	3.5	6	2½	3	1	2½	5	10	35	15	—½	+4	Dy.
*Maryville	4.0	8	2	2	..	3	11¼	..	25	13	...	...	..
*Mexico	4.8	8	3	4	..	2	17½	..	50	20	0.1	+10	Dy.
*Moberly	8.2	7	3	4	..	2	17½	..	50	20	0.1	+10	Dy.
*Palmyra	2.5	7	..	2	..	3½	15	6	50	20	—½	+5	Dy.
Poplar Bluffs	2.2	7½	5	5	0	1½	12½	..	35	Sp	—100	+500	Yr.
*Rich Hill	4.0	12	6	6	0	4½	17½	..	50	20	0.1	+10	Dy.
St. Louis	451.8	7	5	5	..	8	7½	..	30	10	—1	+138	Dy.
*Sedalia	14.1	7	5	5	..	8	18¾	..	30	10	—1	+28	Dy.
*Springfield	21.9	10	5	2	..	3½	..	..	25	10	1	+50	Dy.
*Tarkio	1.2	9½	2½	3½	0	3	7½	10	35	15	0.1	+4	Dy.
*Webb City	5.0	8	3	5	..	4	11	..	67	11	—3¾	+513	Mo.
ARKANSAS.													
*Fort Smith	11.3	10	2	2	..	3	..	..	25	25	F	F	..
*Helena	5.2	9	4	5	..	3	5	6	30	Sp	0.1	+20	Dy.
*Pine Bluff	10.0	7	5	5	..	8	18¾	..	30	10	—1	+28	Dy.
*Texarkana	6.4	15	5	5	..	8	8¼	12	50	Sp	—0.1	+25	Dy.
TEXAS.													
*Beeville	1.8	22	10	12	..	17	..	..	..	..	...	...	..
Belton	3.0	10	5	6	..	..	9¼	..	Sp	Sp	...	...	..
*Big Spring	1.2	24	8	6	..	18	17½	..	..	..	...	...	..
*Calvert	2.6	12	5	..	..	6½	..	..	50	50	F	F	..
*Cameron	1.6	12	6	3	..	..	9	..	..	..	...	...	..
*Cisco	1.1	13	3	5	..	4	..	..	..	..	...	...	..
*Cleburne	3.3	6	1	3	..	4	15	..	20	10	—15	+300	Dy.
*Corpus Christi	4.4	30	12	..	..	36	..	..	100	Sp	—1½	+150	Mo.
Dallas	38.1	6	4	4	2	..	5	..	..	..	...	...	..
*Decatur	1.7	21	..	6	..	..	36	..	100	100	F	F	..
Fort Worth	23.1	10	5	6	..	..	..	10	40	Sp	0.1	+5	Dy.
Galveston	29.1	6	3	6	2	..	8¾	..	33	S1	3¾	...	Mo.

* Private ownership. M = By meter, only. Sp = Special. S1 = Sliding scale (see p. 1.).
F = Flat rate. — = Less than. + = More than (see p. 1.).

R. D. WOOD & CO.

WORKS:
Millville, N. J.
Florence, N. J.
Camden, N. J.

No. 400 Chestnut Street

PHILADELPHIA

Engineers, Machinists, Iron Founders,

CONSTRUCTORS OF

Gas and Water-Works

Gas Holders *With or Without Metal Tanks*

Turbines, Water Power Pumps,
Loam Castings and Heavy
Special Machinery

Manufacturers of all Kinds
and Sizes of Cast Iron

PIPE

Mitchell Scrubbers Purifiers
Condensers

Mathews' Single and Double-Valve **Fire Hydrants**

EDDY VALVES

"Cutting-in" Specials
Valve Indicator Posts

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year.						Meter Rates.					
		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $.	Price per 1,000 galls., cts. Max.	Price per 1,000 galls., cts. Min.	Quantity at each price, 1 = 1,000 galls. At max. price.	Quantity at each price, 1 = 1,000 galls. At min. price.	Period.
Hillsboro	2.5	10	5	6	..	12	Sp	50	45	45	F	F	..
*McGregor	0.8	12	3	6	2	..	Sp	..	..	..	...	...	..
New Braunfels	1.6	12	6	3	..	3	6	..	..	..	...	...	..
*Palestine	5.8	19	9½	12	..	6	..	..	..	..	...	...	..
*San Antonio	37.7	9	4½	4½	..	..	..	..	38	19	0.1	+30	Dy.
*San Marco	2.3	18	..	..	..	..	6	..	50	50	F	F	..
Sherman	7.3	6	5	5	..	7	Sp	..	50	Sp	—1	+20	Dy.
*Valley Mills	0.3	12	..	3	..	..	0	..	..	..	...	...	..
Victoria	3.0	14	6	6	..	6	Sp	..	..	..	...	...	..
*Waco	14.4	6	1½	3	..	4	15	..	20	10	—15	+300	Dy.
*Weatherford	3.4	12	6	6	..	12	12	12	50	25	—1	+5	Dy.
OKLAHOMA.													
Guthrie	2.8	6	6	3	..	2	..	6	40	20	0.1	+3	Dy.
*Oklahoma City	4.2	7	3	5	..	7	7½	..	50	13	0.1	+30	Dy.
*Perry	5.8	7	3	5	..	7	7½	..	50	13	0.1	+30	Dy.
COLORADO.													
Boulder	3.3	10	3	..	..	..	5	..	..	..	...	...	..
Castle Rock	0.3	Water furnished without charge.											
Colorado Springs	11.1	14	2	1	..	2	0	..	7	7	F	F	..
*Denver	108.2	5½	4	4	..	2½	11	..	20	10	1	+637½	Mo.
Durango	2.7	16½	..	0	..	..	6	..	..	..	...	...	..
Georgetown	1.9	16	0	0	..	3	0	..	60	43	½	+4	Dy.
*Grand Junction	2.0	21	6	6	..	6	..	72	30	13	1	+20	Dy.
Greeley	2.4	7½	3¾	..	..	4	..	..	..	..	...	...	..
*Gunnison	1.1	7	5	5	..	6	..	..	60	30	—½	+20	Dy.
Longmont	1.5	14	2	2	..	4	..	..	30	10	—10	+200	Dy.
Manitou Springs	1.4	13	3	2	..	4	..	No meters in use.					
Ouray	2.5	15½	3	1¾	..	..	25	..	100	100	F	F	..
Rocky Ford	0.5	6	..	..	..	3	3	..	..	..	...	...	..
*Trinidad	5.5	13	5	5	0	6	5	..	30	10	0.2	+8	Dy.
NEW MEXICO.													
*Las Vegas	2.4	18½	6	6	..	..	Sp	..	..	..	...	...	..
*Raton	1.3	30	9	9	..	6	12½	None.	50	30	—0.2	+4	Dy.
*Santa Fe	6.2	24	6	9	..	6	..	..	50	30	...	...	..
*Silver City	2.1	21	..	..	..	6	..	..	75	75	F	F	..
WASHINGTON.													
*Blaine	1.6	22	3½	7¾	..	..	33	60	67	33	...	...	Mo.
*Centralia	2.0	15	4¼	4¼	3	6	..	..	50	30	—1	+4	Dy.
*Chehalis	1.3	18	6	12	..	12	5	..	75	75	F	F	..
Dayton	1.9	12	6	..	..	..	..	..	30	15	1	+100	Mo.
Garfield	0.3	18	..	3	..	3	..	36	20	15	—30	+30	Mo.
New Whatcom	2.1	4¾	1¾	1¾	..	..	..	No meters in use.					
*No. Yakima	1.5	15	4	4	..	..	..	..	30	20	1	+120	Mo.
Seattle	42.8	10	2½	2½	..	..	0	29	20	S1	—12	+200	Mo.
Shelton	0.6	12	6	0	..	6	..	..	..	..	...	...	..
*South Bend	...	18	6	6	..	12	..	..	56	27	—30	+300	Mo.
Tacoma	36.0	15½	3	3	..	6	2½	12	25	6	4	+1,000	Mo.
Tekoa	0.3	18	6	6	..	..	..	..	30	15	1	+100	Mo.
Waitsburg	0.8	12	6	6	..	..	..	12	30	15	1	+100	Mo.
*Walla Walla	4.7	12	9	6	..	M	4	18	30	16	1	+100	Mo.
OREGON.													
Astoria	6.2	18	6	6	..	9	..	..	50	S1	—10	...	Mo.
Baker City	2.6	18	6	0	..	12	..	..	25	20	1	+50	Mo.
*Corvallis	1.5	18	12	6	..	12	..	..	..	..	...	...	..
*Independence	1.0	12	6	6	..	6	..	..	..	..	...	...	..
La Grande	2.6	12	6	6	..	12	..	..	25	20	10	+50	Mo.
*Lebanon	0.8	12	3	0	..	3	0	12	25	Sp	1	+100	Mo.
Oregon City	3.1	12	3	0	..	3	..	12	15	Sp	1	+100	Mo.
Portland	62.0	9	9	6	..	3	..	..	30	S1	—25	...	Mo.
*Portland	62.0	6	9	6	..	12	..	12	30	15	1	+100	Mo.
*Salem	10.5	12	6	6	..	6	..	..	25	10	1	+200	Mo.
Weston	0.5	18	..	0	..	6	..	..	..	..	...	...	..
CALIFORNIA.													
*Berkeley	5.1	15	4¼	4¼	..	6	50	18	40	35	—5	+5	Mo.
*Calistoga	1.1	15	..	6	..	6	51	..	50	38	—20	+20	Mo.
*Chico	2.9	12	..	..	..	6	21	..	50	38	—20	+20	Mo.
*Colusa	1.3	14	6	0	..	3	..	..	50	50	...	...	..
*Coronado	...	18	6	6	..	6	12	30	30	S1	10	...	Mo.
*Eureka	4.9	18	3	3	..	6	..	12	50	25	10	+10	Mo.
*Hanford	0.9	18	6	6	..	9	..	..	..	..	...	...	..
*Hollister	1.2	18	6	..	..	6	..	..	..	..	...	...	..

* Private ownership. M = By meter, only. Sp = Special. Sl = Sliding scale (see p. i.).
F = Flat rate. — = Less than. + = More than (see p. i.).

UNION WATER METER CO.,

WORCESTER, MASS.

STANDARD WATER METERS

UNION ROTARY AND COLUMBIA METERS.

AUTOMATIC * WATER * PRESSURE * REGULATORS.

Union Meters unequaled for Durability and Small Cost of Maintenance.

WRITE FOR PRICES.

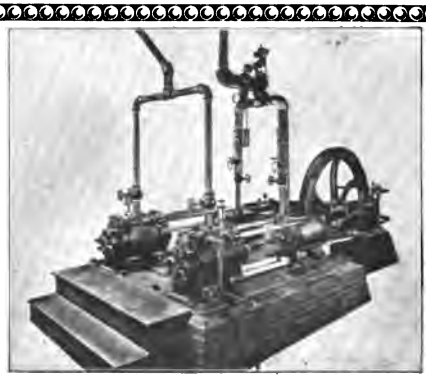
Neptune Meter Company,

MAKERS OF THE TRIDENT WATER METER

No. 253 Broadway, Postal Telegraph Building, New York City.

THE METER THAT WORKS BEST

Frost insurance; sensibility; durability; capacity; breakage; cost of maintenance and degree of accuracy, *written in the contract* The **TRIDENT** is the quickest success in Water Meters ever put upon the market.



ECONOMICAL RESULTS

In Small, Medium-Size and Large Plants Using

HIGH GRADE AIR COMPRESSORS AND

Our Systems of

PUMPING WITH COMPRESSED AIR.

JOHN KEAN, JR., Prest. L. B. BATTIN, Eng. J. W. WHELAN, Sec. and Treas.

THE ELIZABETHTOWN WATER COMPANY,

ELIZABETH, N. J., January 20, 1897.

PNEUMATIC ENGINEERING CO., 100 Broadway, N. Y.,

Gentlemen: The pumping plant you furnished for our Wells at Union, N. J., is giving entire satisfaction. We consider the Cross Compound Compressor an economical machine, and in connection with the system you furnish give us very satisfactory results. We would be glad to recommend your machinery to anyone considering a system of pumping with Compressed Air.

Very truly yours, L. B. BATTIN, Engineer.

PNEUMATIC ENGINEERING CO., 100 BROADWAY, N. Y.

City and State.	Population, 1890 Census.	Fixture Rates, Dollars per Year. Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Meter Rates. Min. charge, per year.	Price per 1,000 galls., cts. Max.	Min.	Quantity at each pr.ce, 1 = 1,000 galls. At max. price.	At min. price.	Period.
*Long Beach	0.6	18	0	0	0	1¼	0	..	5	4	—10	+10	..
*Los Angeles	50.4	15	2½	2½	..	2½	6	..	29	27	—15	+15	Mo.
*Los Gatos	1.7	15	4¾	3½	..	4¼	..	12	50	S1	2	...	Mo.
*Marysville	4.0	24	6	6	..	24	..	..	50	50	F	F	..
*Merced	2.0	12	3½	3½	..	6	..	..	50	30	5	+50	Mo.
*National City ...	1.4	13	4¾	3½	..	6	7	12	30	8	...	...	..
*Oakland	48.7	16	..	..	..	3	16	..	20	20	F	F	..
Oceanside	0.4	18	6	6	..	..	9	..	75	15	2	Mfg.	..
*Pacific Crove ...	1.3	21	6	6	..	9	75	60	75	45	1	+100	Mo.
*Pasadena	4.9	18	3	3	..	..	..	..	20	8	—7½	+158	..
*Pasadena	4.9	18	3	3	..	3	..	..	25	25	5	+5	..
*Pasadena	4.9	18	3	3	..	..	..	..	10	S1	—7½	...	Mo.
*Petaluma	3.7	11	6	3	..	4¾	25	..	50	25	—5	+40	Mo.
*Redding	1.8	15½	6	6	..	6	M	24	33	S1	¾	...	Mo.
*Redondo Beach .	0.6	18	6	3	..	..	..	..	..	..	...	...	..
*Rio Vista	0.6	18	6	6	..	6	..	..	..	..	...	...	..
*Riverside	4.7	12	4¼	3	..	3	..	12	..	..	...	...	..
Sacramento	26.4	15	..	..	..	3½	..	..	..	..	...	...	..
*Salinas	2.3	9	0	0	0	2½	..	..	15	Sp	—20	+20	Mo.
*San Diego	16.2	12½	3	3	..	..	..	21	20	20	F	F	..
*San Francisco ..	299.0	12	3	4¼	..	3½	..	30	39	S1	—15	...	Mo.
San Jacinto	0.7	12	..	..	..	0	6	..	..	..	...	...	..
*San Luis Obispo.	3.0	30	12	..	..	9	..	..	..	..	...	...	..
Santa Ana	3.6	12	..	..	..	2½	0	..	..	..	...	...	..
Santa Cruz	5.6	10	2½	2½	..	1¼	..	..	15	15	F	F	..
*Ukiah	1.6	16	6	..	..	3	..	..	50	40	1	+1	Mo.
Vallejo	6.3	12	3	0	..	2½	25	..	30	20	1	+20	Dy.
*Ventura	2.3	12½	3	1¾	..	3	..	..	75	S1	—1	...	Mo.
ARIZONA.													
*Phoenix	3.2	24	8½	0	..	..	..	..	70	S1	—10	...	Mo.
Prescott	1.8	..	..	..	..	..	..	12	35	35	F	F	Mo.
NEVADA.													
*Reno	4.1	24	6	..	..	..	0	No meters in use.					
UTAH.													
*Forest Dale	0.3	5½	..	1	..	..	25	..	..	..	...	...	..
*Ogden	14.9	9	0	0	..	4½	30	..	35	12	—30	+300	Mo.
Provo City	5.2	4	1½	¾	..	..	..	..	..	..	...	...	..
Salt Lake City ...	44.8	7	1	1	..	2	25	..	25	25	F	F	..
IDAHO.													
*Boise	2.3	18	6	6	..	6	15	24	40	25	—40	+120	Mo.
*Pocatello	2.3	18	3	6	..	9	..	..	..	..	...	...	..
*Rathdrum	0.2	24	..	..	..	..	..	No meters in use.					
NEW BRUNSWICK.†													
Fredericton	6.5	5	5	5	1	5½	3	..	25	25	F	F	..
Moncton	8.8	10	3	2	..	3	3	..	..	..	...	...	..
St. John	30.2	4	5	3	½	2	..	..	10	Sp	—100	...	..
NOVA SCOTIA.													
Amherst	3.8	5	2	1	..	2	..	..	Sp	Sp	...	...	..
Dartmouth	6.2	6¾	4	..	..	7	..	..	..	..	...	...	..
Digby	0.1	5	3	2	1	3	..	..	..	..	...	...	..
Halifax	38.6	Sp	4	..	..	..	..	..	15	8	—1	+60	Dy.
*Lunenburg	4.4	8	5	5	..	5	4	..	..	..	...	...	..
Sydney	2.4	5	2	2	..	5	..	..	100	100	F	F	..
Westville	3.2	6¾	2	2	1	..	..	20	Sp	Sp	...	...	..
Wolfville	2.0	5	3	5	2	2	..	..	..	..	...	...	..
Yarmouth	6.7	9	4¾	4¼	3½	2½	1¾	..	36	Sp	0.1	...	..
PRINCE EDWARD ID.													
Charlottetown ...	11.4	6	5	3	1	3	2	10	30	30	F	F	..
QUEBEC.													
Buckingham	2.2	..	3	3	..	2	2	..	..	..	...	...	..
Cookshire	0.4	6	3	2	..	1½	2	..	15	15	F	F	..
Lachine	3.8	..	3	..	..	1½	2	90	30	15	—1	+5	Dy.
Montreal	216.7	..	0	1	..	2	2	..	30	15	—1	+10	Dy.
*Rock Island	0.8	6	4	3	½	1½	4	..	..	..	...	...	..
*Ste. Cunegonde .	9.2	..	0	1	..	2	2	..	30	15	—1	+10	Dy.

* Private ownership. M = By meter, only. Sp = Special. Sl = Sliding scale (see p. i.). F = Flat rate. — = Less than. + = More than (see p. i.).

† Presumably all gallons in Canada are Imperial; rates per 1,000 U.S. gallons would be about one-sixth less.

THE WARREN FILTER

COMBINING THE ADVANTAGES OF

COAGULATION,

SEDIMENTATION,

FILTRATION.

LIST OF WATER WORKS USING THE WARREN FILTER.

			Daily Capacity in Gallons.
Bangor Water-Works	Bangor, Me.		5,000,000
Knoxville Water Co.	Knoxville, Tenn.	3,500,000	
Knoxville Water Co. (2d order)	Knoxville, Tenn.	1,500,000	
			5,000,000
Biddeford & Saco Water Co.	Biddeford, Me.		3,000,000
Decatur Water-Works	Decatur, Ill.		3,000,000
Oshkosh Water-Works Co.	Oshkosh, Wis.	2,000,000	
Oshkosh Water-Works Co. (2d order)	Oshkosh, Wis.	400,000	
			2,400,000
Maine Water Co.	Brunswick, Me.	600,000	
Maine Water Co (2d order)	Calais, Me.	1,500,000	
			2,100,000
Warren Water Co.	Warren, Ohio.		1,500,000
Athens Water-Works	Athens, Ga.		1,000,000
Winfield Water Co.	Winfield, Kan.		1,000,000
Reading Water-Works	Reading, Mass.		1,000,000
Durham Water Co.	Durham, N. C.		900,000
Berwyn Water Co.	Pickering Creek, Pa.		750,000
Augusta Water Co.	Augusta, Me.		600,000
Macon Gas Light & Water Co.	Macon, Ga.		500,000
Winston Water-Works	Winston, N. C.		500,000
Keyport Water-Works	Keyport, N. J.		500,000
Goldsboro Water Co.	Goldsboro, N. C.		500,000
Gettysburg Water Co.	Gettysburg, Pa.		300,000
North Berwick Water Co.	North Berwick, Me.		300,000
Bryn Mawr Water Co.	Overbrook, Pa.		250,000
West Reading Water Co.	Reading, Pa.		250,000

ESTIMATES FURNISHED. CORRESPONDENCE SOLICITED.

RESULTS GUARANTEED.

CUMBERLAND MFG. CO.

220 Devonshire Street, - - BOSTON, MASS.

City and State.	Population, 1890 Census.	Fixtures Rate, Dollars per Year.						Meter Rates.					
		Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.	Min. charge, per year, $.	Price per 1,000 galls., cts.		Quantity at each price, 1 = 1,000 galls.		
									Max.	Min.	At max. price.	At min. price.	Period.
St. Hyacinthe	7.0	12	..	..	..	..	..	..	30	15	....	....	..
*Sherbrooke	10.1	10	2	4	..	..	8	..	35	20	0.1	+0.9	Dy.
ONTARIO.													
Beamsville	1.0	5	2	..	½	2	7½	..	30	10	0.1	+20	Dy.
*Belleville	9.9	6	4	3	1	4	6	..	..	..	....	....	..
*Berlin	7.4	6	4	3	1	3	6	..	30	10	0.1	+20	Dy.
Brantford	12.8	5	3¾	3¾	1	2½	11¼	..	19	16	—30	+90	Dy.
Brockville	8.8	13	4	3	0	2½	5	..	30	30	F	F	..
Chatham	9.1	7	3½	3½	1	3½	3½	..	35	12	0.1	+20	Dy.
*Cobourg	4.8	6	3½	3	1	3	5	5	25	Sp	—½	+10	Dy.
Collingwood	4.9	7	2	2	..	2	..	..	16	16	F	F	..
*Cornwall	6.8	6	3½	3	1	3	5	..	25	Sp	—½	+10	Dy.
Dundas	3.5	8	3	2	..	4	11¼	..	..	..	....	....	..
Galt	7.5	7	2¾	2¾	1¼	2	6	6	30	11	0.1	+20	Dy.
Goderich	3.8	6½	4	3	1	2	6½	..	..	..	....	....	..
Hamilton	49.0	..	3	2	..	1½	..	..	30	..	....	....	..
Kincardine	2.6	6	3½	3	1	3	5	..	25	Sp	—½	+50	Dy.
Kingston	19.3	..	3	2	..	2	3½	10	53	12	—6	+40	Qr.
London	32.0	8¾	3½	4	..	2	9½	..	24	Sl	—90	....	Qr.
Merritton	1.8	5	..	..	0	..	0	No meters in use.					
New Market	2.1	6	2	2	0	2	6¾	..	20	20	F	F	..
Niagara Falls ...	3.3	5	2	2	1	2	5½	10	60	25	....	....	..
North Toronto ..	....	3¼	¾	¾	..	¾	3¼	..	8	8	F	F	..
Orangeville	3.0	7	..	3	..	1½	5¾	..	25	25	F	F	..
Ottawa	44.2	..	..	2	..	2	..	..	8	8	Large quantities.		
Owen Sound	7.5	3	2	1	2	2	4	..	20	8	—¼	+2	Dy.
Paris	3.1	8	4½	1	..	2	11½	..	Sp	Sp	....	....	..
Pembroke	4.4	8	3	2	1	2	6	..	..	..	....	....	..
Picton	3.3	5	2	2	0	1	6½	..	88	19	—6	+250	Qr.
Port Hope	5.0	6	3½	3	1	3	8¼	5	25	10	—½	+5	Dy.
St. Catharines ...	9.2	5	2	2	1	2	3	..	19	11	—0.6	+4	Dy.
St. Thomas	10.4	8	2	2	..	1½	7	..	..	..	....	....	..
Sandwich	1.4	10	5	5	..	2½	6	8	40	40	20	+20	Qr.
Sarnia	6.7	8	4	3	1	1½	6	..	25	5	—1	+500	..
Sudbury	1.4	8	0	2	1	2	2	..	..	..	....	....	..
Toronto Junction.	4.5	7¼	2½	2½	..	4	6¾	..	..	..	....	....	..
*Trenton	4.4	8¾	3½	4	..	2	7	..	23	Sl	—120	....	Qr.
*Waterloo	2.9	6	4	3	1	3	6	..	30	10	0.1	+20	Dy.
MANITOBA.													
Brandon	3.8	10	3	4	..	2	7	..	33	15	0.1	+30	Dy.
BRITISH COLUMBIA.													
Vancouver	13.7	9	3	4	..	4	6	..	47	16	8	+300	..
Victoria	16.8	..	..	..	..	2	..	12	20	Sl	....	....	..

* Private ownership. M = By meter only. Sp = Special. Sl = Sliding scale (see p. i.).
F = Flat rate. — = Less than. + = More than (see p. i.).

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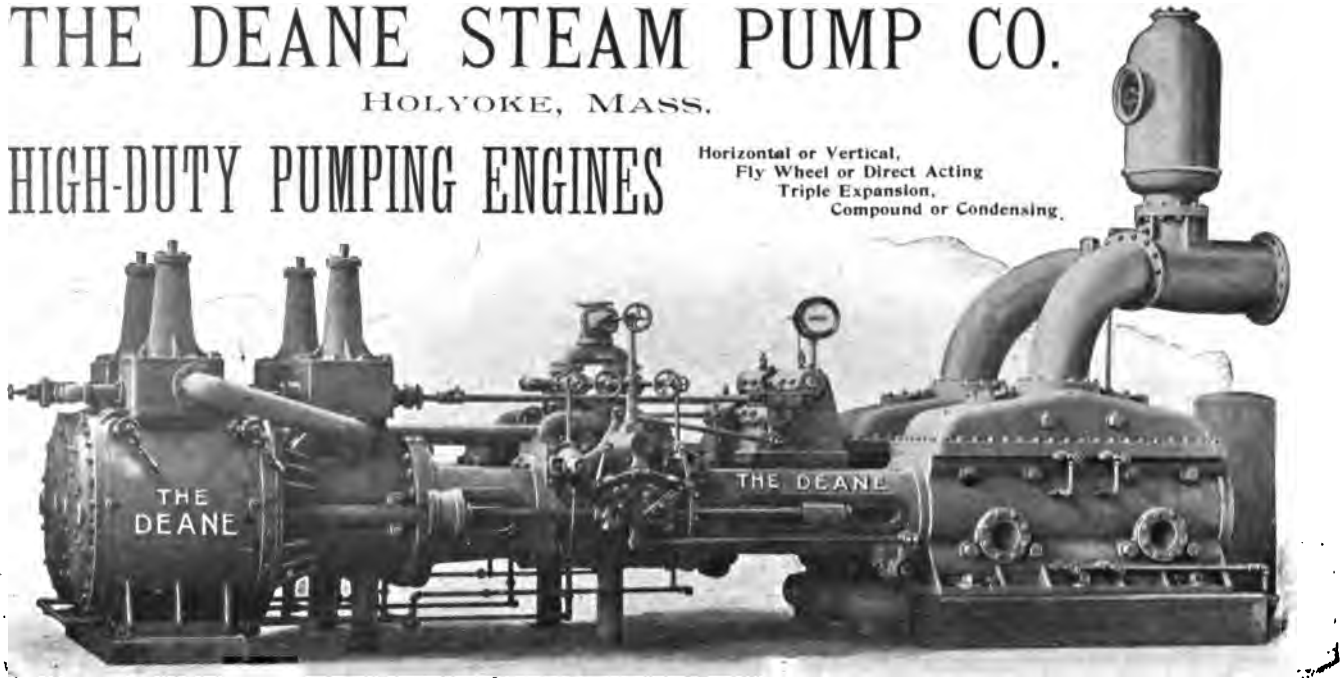

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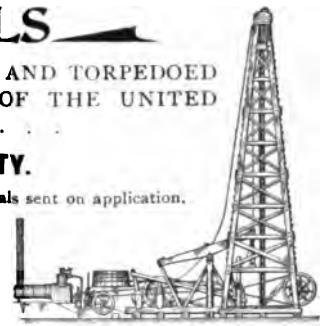

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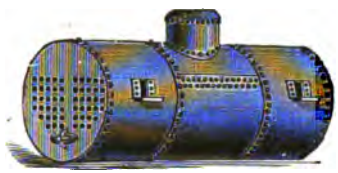

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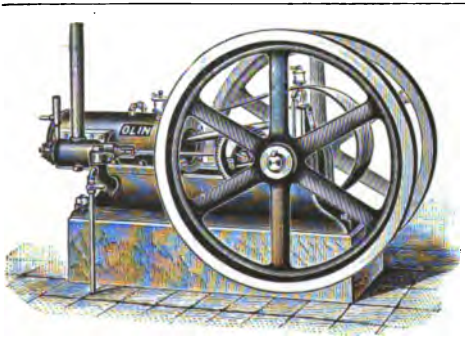

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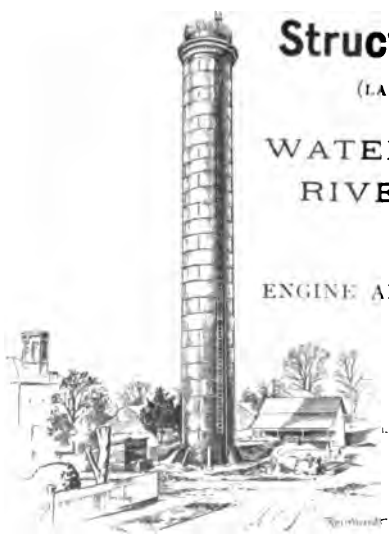

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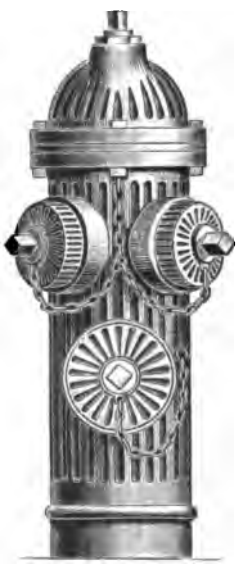

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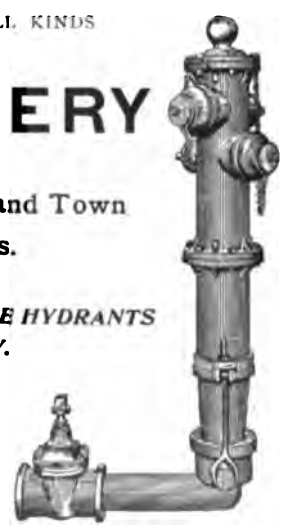

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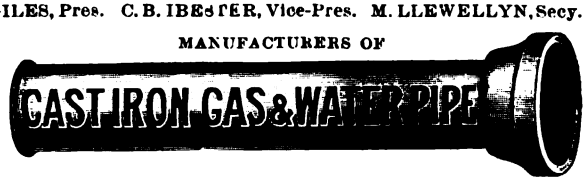

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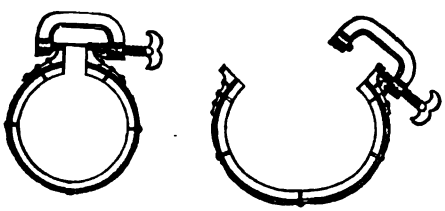

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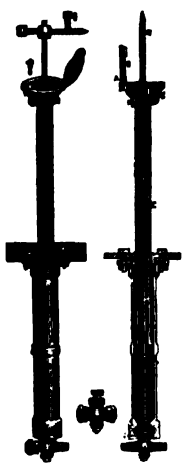

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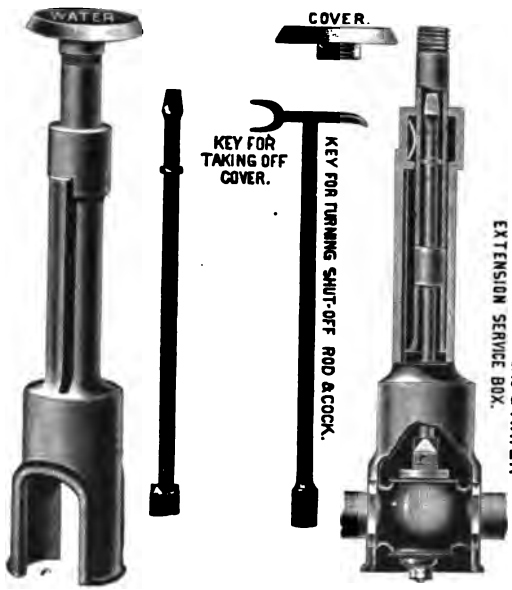

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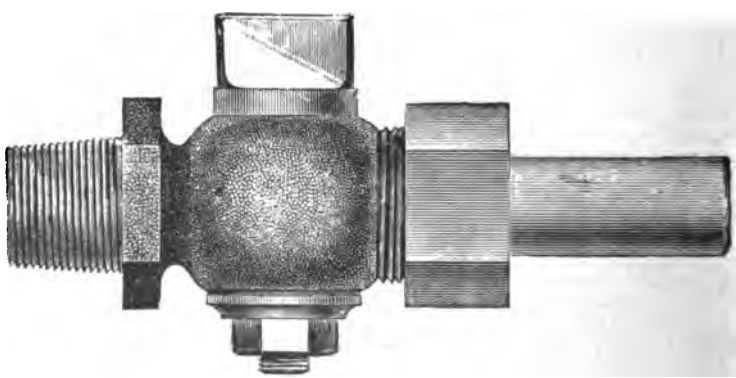

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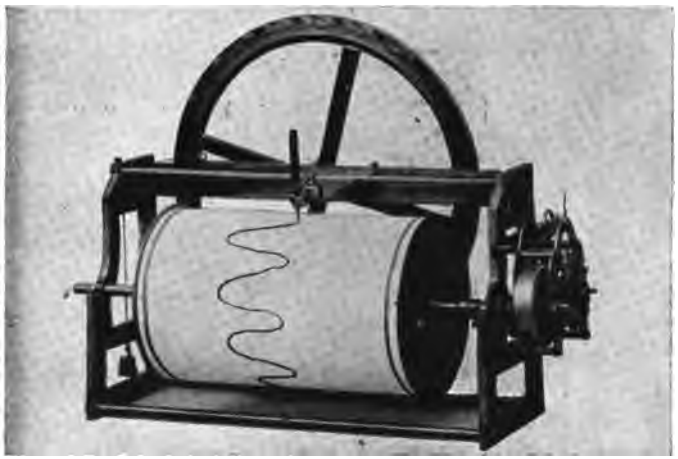

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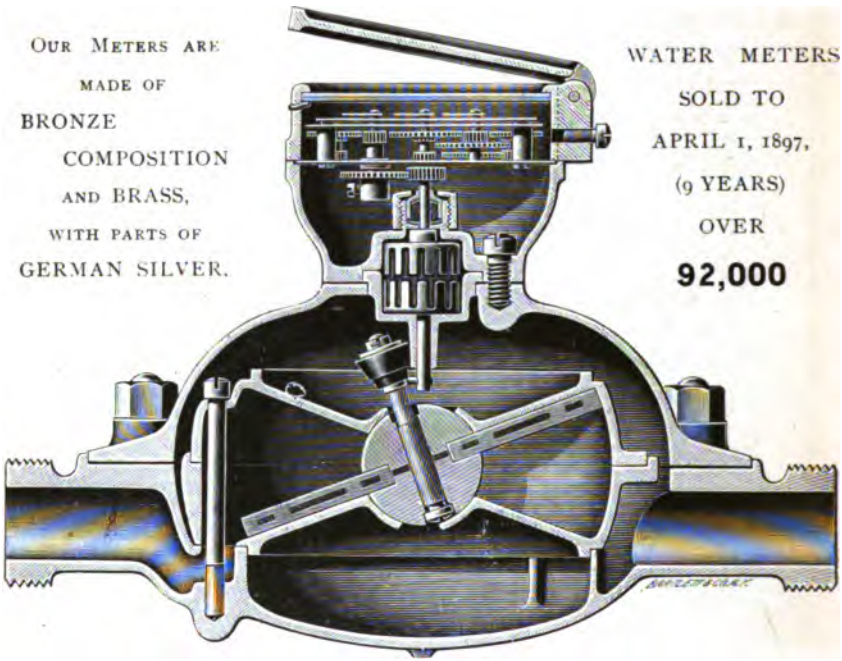

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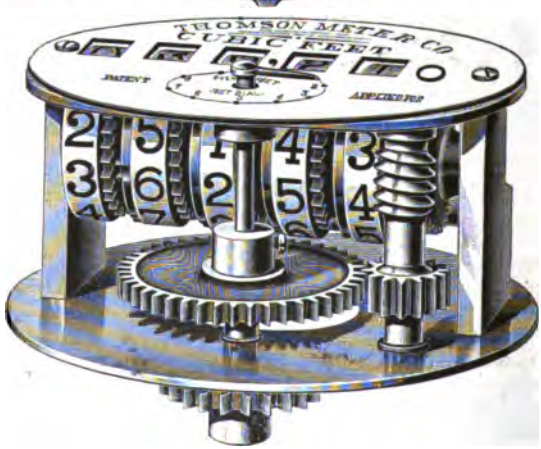

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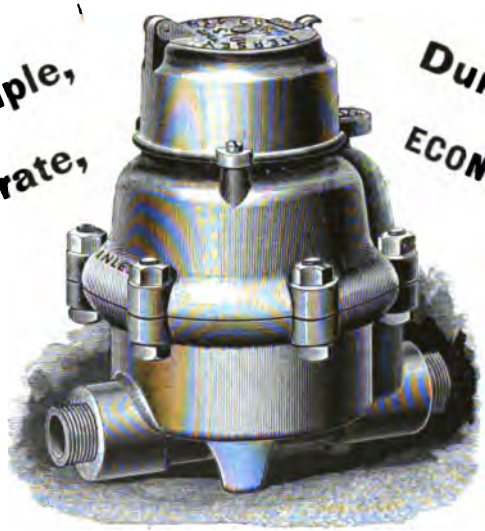

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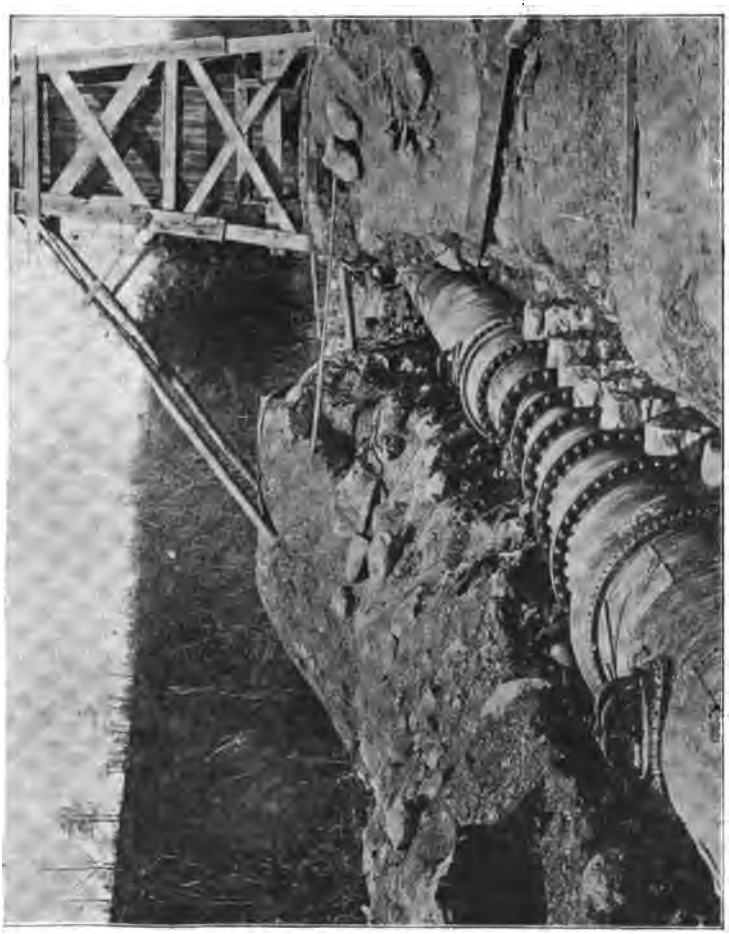

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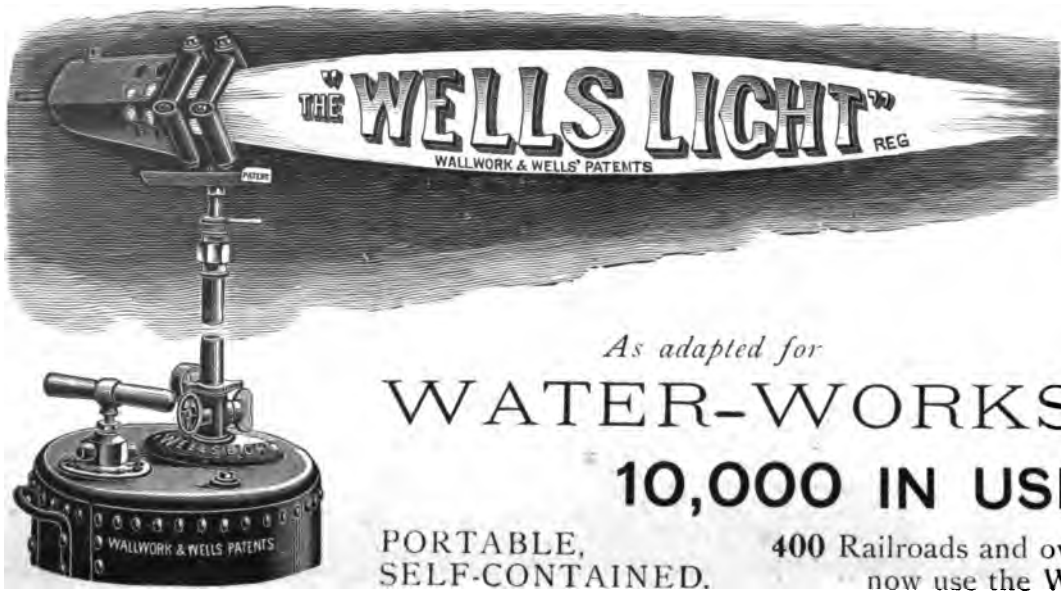

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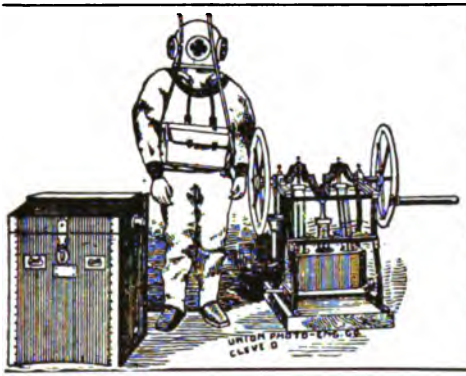

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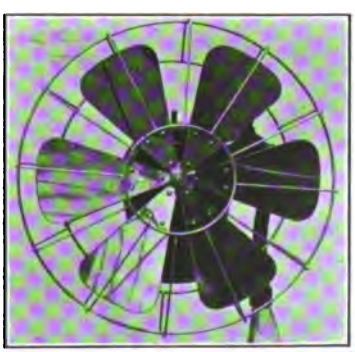

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